DOCUMENT RESUME

ED 033 512 EC 004 633

TITLE	The Utilization of Supportive Personnel in Speech Correction in the Public Schools.
INSTITUTION	Colorado State Dept. of Education, Denver.
Spons Agency	Office of Education (DHEW), Washington, D.C. Bureau of Education for the Handicapped.
Pub Date	May 68
Note	180p.
EDRS Price	EDRS Price MF-$0.75 HC-$9.10
Descriptors	Administration, Auditory Evaluation, Aurally Handicapped, *Exceptional Child Research, *Instructional Aids, Language Development, Nonprofessional Personnel, *Program Evaluation, Speech Evaluation, Speech Handicapped, *Speech Therapists, *Speech Therapy, Standards, Teacher Attitudes, Teaching Methods

Abstract

A pilot program for supportive personnel in speech pathology and audiology began with 3 weeks of formal training. Ten speech aids then worked for 10 weeks in nine school districts. Speech correctionists evaluated the aids and indicated that they were most helpful in articulation and language drills, carry-over activities, ear training, preparation of therapy material, and record keeping. Eleven of 14 correctionists felt that they would like to have the continued services of an aide although many negative attitudes toward aides were in existence (many correctionists felt threatened). The speech aides also evaluated the program; favorable reactions were expressed toward the field of speech correction, and seven aids said they would like to continue their work. Speeches made to the trainees are presented and include the following: public school organization and administration; the role of the speech specialist; professional responsibilities and ethics; child growth, speech, and language development; the speech mechanism; disorders of speech and language and their evaluation and rehabilitation; the hearing mechanism; hearing disorders, evaluation, and rehabilitation; and identification audiometry. (RJ)

ED033512

THE UTILIZATION OF SUPPORTIVE PERSONNEL IN SPEECH CORRECTION IN THE PUBLIC SCHOOLS

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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A Pilot Project supported by the Colorado State
Department of Education under Title VI,
Elementary and Secondary Education
Act, Bureau of the Handicapped,
U.S. Office of Education

February 14 -- May 24, 1968

Jerome G. Alpiner, Ph.D., University of Denver
Project Director

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ACKNOWLEDGMENT

Many individuals and school districts deserve grateful thanks for making this pilot project possible. These include, particularly, Mr. James E. Wiggins, Consultant, Title VI, ESEA; and Dr. John A. Ogden, Director, Special Education Services, Colorado Department of Education. Without the cooperation of the school districts, their directors of special education or services, their speech correctionists, and the speech aides, this program could not have been conducted. The names of these persons are included in the proceedings.

We sincerely thank the Bureau of the Handicapped, U. S. Office of Education, for its support to the State of Colorado, which permitted the funding of this project.

All of us are appreciative of the instructors in the training program from Adams State College, Colorado State College, The University of Colorado, Colorado State University, and The University of Denver, and from the Fort Collins Public Schools, the Greeley Public Schools, and the Denver Public Schools.

Our thanks also go to Adams District #12 for providing classroom space; and to Adams # 14 for handling accounting procedures.

PREFACE

The utilization of supportive personnel in speech pathology and audiology has been of extreme interest for some time. Various published articles have discussed both the advantages and disadvantages of such personnel.

The State of Colorado, through the State Department of Education, undertook this pilot project to help determine the feasibility of speech aides in the public schools. While one cannot over-generalize the findings of this project, it is quite possible that certain trends might emerge as to whether or not aides can be effectively utilized in the public schools in assisting speech correctionists.

This pilot program began on February 14, 1968, with a three-week formal training program. Upon completion of training, ten speech aides worked in nine school districts in the Denver metropolitan area until May 24, 1968. Five of the speech aides worked for one speech correctionist, and the remaining five aides worked for two correctionists. Both the speech correctionists and the speech aides completed specific questionnaires after the completion of the project. Response to the questionnaires was followed by separate sessions with the correctionists and the aides.

These proceedings of the entire project include the lectures presented to the aides during the three-week formal training program, as well as an analysis of the questionnaires which were completed after the aides had finished their work for the speech correctionists.

The appendices include the training program agenda and the forms utilized for evaluation. If the project were to be duplicated, various changes in programming would be implemented.

I hope this report will be useful to those contemplating the use of supportive personnel in speech pathology and audiology.

Jerome G. Alpiner, Ph.D.
Project Director

PARTICIPATING SCHOOL DISTRICTS and ADMINISTRATORS

School District	Administrator
Adams #1	Mr. Larry Reynolds
Adams #12	Mr. Charles DeVoe
Adams #14	Mr. Joe Douglas
Adams #50	Dr. John Flynn
Aurora #28J	Mr. Reginald Gladhart
Boulder #2	Dr. Iona Taylor
Denver #1	Mr. Theodore White
Jefferson	Dr. Bob Weiland
Weld #6	Dr. Alton Cowan

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School District	Speech Correctionist	Speech Aide
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Adams #12	Mrs. Paula Johns Mr. Grady Reese	Mrs. Lyman Snyder
Adams #14	Miss Elizabeth Clanan Miss Marlene Poch	Miss Linda Hoppert
Adams #50	Mrs. Marlys White	Mrs. Joyce Rollings
Aurora #28J	Miss Susan Dickey Mrs. Pat Smith	Mrs. Evelyn Rappath
Boulder #2	Mrs. Karen Nelson Mrs. Joy Petersen	Mrs. June Witter
Denver #1	Mrs. Martha Abernathy	Mrs. Anna Laughlin
Jefferson	Mr. Mark Malone	Mrs. Phyllis Booth
Weld #6	Mrs. Dorothy Faulkner	Mrs. Carol Bibbey

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The Training Program

Public School Organization and Administration

Miss Lois Field

Many of the things I want to say this morning are not just about our school but about the organization of schools in general. This program of Aides could not be paid for by the schools because of insufficient funds for teachers. We believe we have taken a great step forward in the Denver schools. Beginning next fall, under the new scale, the starting salary will be $6,000. It does make you wonder, doesn't it, about the business of education and some of the things that are going on.

I think when we are ready to look at the organization of an elementary school, because it has become a complicated affair, we need to look back a bit as to why it has become such a complicated affair. It is a complicated process. The main thing, of course, is to try to do better for the child. It is amazing to me as I look at the operation of our program and wonder how in the world there could be quite so much going on, with the number of personnel we have and other individuals who must blend around the program. Any well-run elementary school program is amazingly time-consuming. It is wonderful to think of things that are going on for children. Let us think back for a minute to the one-room school house; that is where I began my teaching. I know the children learned, and sometimes as I look back to that experience and then look at the complicated operation that goes on today in my school, I wonder if it is really necessary to have all of these things. Of course it is; we know that when we stop to analyze it. We have come a long way. Then we went to the consolidated school, and now we have come to the elaborate, individualized process and are trying to do more for the future. This follows the progress of education.

I can remember back to when a teacher came before her class and put forth a bundle of knowledge every day, and every child was expected to get this as best he could. If he got it, fine; if he could not get it, that was just too bad - but nobody worried a great deal about this in the old days of education. The teacher looked at herself as an expert; she did have the training; she came prepared each day; the children were there; and it was too bad if Johnnie could not learn. There was not very much looking around to see why Johnnie could not learn. Then we began to read and hear about "individual differences." It was a wonderful new idea that children were different. Now there weren't just a lot of children sitting out there in a classroom who were all pretty much alike and because they were in the third grade they were supposed to be getting what was done in the third grade. Now we were talking about individual differences. I remember what resistance there was at first. Classes were large in those days. My first year in the Denver Public Schools in 1935, I had 55 children in grades 5A, 6B, and 6A - it was a three-ring circus.

When we first began to talk about individual differences we were inclined to say, "How in the world can I look at each child as an individual? I have all *of this work to prepare, to teach, and all of these subjects - and to look at all these youngsters as individuals is a pretty hard thing to do." Gradually ways to do this were implemented and the result is that schools have become the complicated operation they are today. In Denver, with our new superintendent, we are even now having a more forward look about individualized schools - not just looking at children with individual differences. We have come a long way in the time I speak of, but Dr. Gilberts is saying to us: "I want to clear the way so that schools can be very individualized, where a faculty, a principal and staff can sit down together and discuss things they think should be done. I want to clear the way, if possible, so that these things can be done." He even spoke the other day in a small group session I was in of one of his ideas. A way to do this would be to have the school pick two or three days during the year that the children would not come to school and then the staff would have time to sit down and plan what would be best to do. This, of course, would have to be a well-organized meeting; every moment would have to be used to the best advantage. This would only be right, because as he says, "with greater freedom comes greater responsibility." Many of us look at this as a wonderful, new day when, at long last, we will have time to spend together on the job to see what steps we might take, rather than trying to do this at the end of the day when we are very tired as almost everyone is at the end of a day of teaching.*

I think it is rather interesting here in Adams County to have these individualized districts - quite a different thing than in Jeffco and Denver where it is all under one county. All of this is a part of breaking things down so we can do the best job individually for each child.

Now as to organization of public schools as we see them today. We hear about the unit-type school, and when we talk about a unit-type of organization we are speaking of a school where the children would go into a certain classroom in the morning and remain there all day, then go home in the afternoon. Not, of course, for lunch - but so far as instruction is concerned. This would be a pure unit-type situation. By contrast, when we talk about a platoon organization, we are referring to a set-up where children are more subject-matter oriented. Generally speaking, the platoon system does not begin in schools until about third grade level. The teachers instruct in particular subjects and the children move about in order to get the subjects from the subject-matter specialists. There are very few straight unit-type situations. A combination of the two types is called a "modified platoon", and there are a great many schools with this type organization. Even a school that is mainly a unit-type school will have some programs which are subject-matter oriented; hence, it becomes a modified platoon.

Our school has such an organization - to be more accurate, we are more of a modified unit-type than are some of the schools. We have a full-time music teacher; some schools have only a part-time music teacher, but this is one area where you need a specialist and where you get away from your straight unit-type organization. We have a physical education teacher, and I think most all schools do these days; a child probably has a need, according to the time allotment suggested in central administration, to have physical education programs *every day and it may not be possible for the P.E. teacher to teach this every day. In such cases the classroom teacher may do some of this work, but the actual teaching of these skills is done by the physical education teacher.*

We have a library in our school, and in most schools there is some sort of central library organization. Sometimes there is no librarian. We have a full-time librarian in our particular set-up, but sometimes there is just a part-time librarian. Sometimes there is a teacher who has some relief time and is responsible for some of the library activity; but again, you see this modified (what would be the straight unit-type of organization).

In our school we happen to have the only art studio in the city of Denver in the elementary schools. This is because we have all of the deaf children from the city of Denver of elementary level - profoundly deaf, partially deaf and hard-of-hearing to the extent that they need special schooling (30 dB loss or more in that hard-of-hearing group.) So we have an art studio there with a special art instructor because this is a very good place to integrate handicapped children with regular children. We do this by having one half of a deaf class, which is four children, and one half of a regular room (which in our school is usually 12 or 13 children because our regular classes are smaller). These two halves go to the art studio one day and the other two halves go the next day. In this way we have a natural way for the integration of the handicapped children in an area where everyone can compete. So this is a little further modification where we have a specialist doing particular work in a particular situation.

We also have other special people in our particular program. This is the kind of organization which goes on in school with special people added in order to get special tasks accomplished for children. This is increasingly true in every place where elementary schools are being organized, started, or added to - just as we see here in this wonderful building. I am reminded of some special programs I have had an opportunity to observe in the last couple of years. The last two years I attended the National Elementary Principals' conventions, and I did this because of the work with the association in Denver. A year ago last spring I went to Portland and stayed an extra day after the convention to visit Irvington School. Here they had decided to use all of the money they had for several schools to greatly improve this one program. It was a very, very fascinating day observing what they had done. This is an elementary school in an area which had been quite a nice residential area of Portland and was becoming an integrated area, so there were concerns. In this particular case, as it became an integrated area from a race standpoint, many of the levels of operation in the community had dropped. The parents of the children had little interest in the education of their children. This seemed rather strange to me because after spending the day there I took a cab and drove all about the area so I could observe conditions. These were nicely-kept homes and yards and it was odd that there was little interest in education and the parents never came to school. So faculty and principal sat down together in the late spring the year before and decided what they would like to do to try to change the organization of the school so there could be more education for children, and how they could build up the interest in the community. This, of course, is a very important thing in any *child's school life. If someone at home (father or mother) will say, "Let's move these things aside on the table so that John has a place tonight to do his homework," this can make all the difference in the world in what a child will do. Just having somebody interested can make such a great difference.*

As they talked about it, they decided that first they needed additional personnel. One of the people they felt was needed was a specialist in reading who would work with the classes of young children and with the teachers of these classes, in order to help with ways to teach the children who were slow in reading how to read - a true reading specialist. At the time we were there, this specialist had worked from September to April with small groups of children, and with teachers in meetings on released time during the school day. This was possible because of increased personnel. They had begun to teach some children to read who had not been able to do so before. This was the work of one particular specialist.

Another thing they wanted to do was have a separate class for some children who caused constant disturbance in every classroom they were in. When they began to analyze how many of these children they had in this school (incidently, the total pupil enrollment was 750), they were surprised to find that they had only fifteen such children. You know a "gadfly" child can seem like five, or seven, or nine children; and these children were all from fourth grade through sixth grade level. Fortunately they had one member of their existing staff who said, "If you will give me these fifteen trouble-makers, put them in one room, and give me some extra helps in materials, I would like to teach these children." They felt this was a wonderful thing for this school. These children were now learning in a different situation and this had an effect on the entire school. I am not sure this would always be the way to handle this situation; it would take an unusual person to teach those fifteen. But he wanted to try it, and apparently it had been very successful.

They also had what they called the community agent, who was a member of the staff who went to visit with the people in the homes. When he first started this work he would say to the parents, "Is there anything at all that you might like to do over at the school? Can you think of anything that is of interest to you; something that you might like to do?" For a while there was no response; and then some father said, "Well, I would sure like to learn how to use tools better. I would like to make things; if they taught anything like that over at school, I would be interested." This community agent made his way about the neighborhood and started all kinds of afternoon, evening, finally Saturday, and even Sunday classes for parents. Some of the classes had only three people in them at first, but they grew. Many of the classes are similar to those taught at Denver's Opportunity School. Some of the mothers wanted to learn cake decorating; some wanted to learn special kinds of cooking; they got all these classes going in the school, so that within just a few months the school had become an absolute integral part of this entire community's life.

It takes a great deal of money to set up all of these classes, but it certainly is indicative, I think, of what the spirit of the public school is today as it *tries to move forward and do more - not just put out the learning to educate the child - but to try to leaven the entire loaf to learn what sort of being this child is. It made all the difference in the world in what children were doing in school. When mother and father were coming over for certain things and there was this interest in the school, then it created an entirely different attitude on the part of the youngsters. When you get a good attitude, then you can teach a great deal more. You can bring a child much further from wherever he is, and that is what the business of education is really about - finding out where a youngster is to begin with - not only in speech correction which we will be talking about a little later, but in anything (arithmetic, reading, etc.) Where is he? How much skill does he have today? If he is a first grader and does not know how to read yet, how much basic ability does he have? Then we take each child just as far as he can possibly go. If we can help his attitude, and if we can make him interested in what is going on, then, of course, he is going to use whatever he basically has very much more effectively in order to learn that much more - whether he has low ability, middle ability, or high ability, the attitude has a great deal to do with it.*

One thing we are doing in many schools in this entire metropolitan area is team-teaching, which is another step beyond unit-type and platoon and modified-platoon, and so on. Again, this is a way in organization of the school to use additional teaching personnel in such a way that is effective for children and does not require extra rooms. Sometimes it is better not to have an extra room. You will see if you observe a team-teaching set-up perhaps one teacher at the end of the room working with a small group of children (8 or 10 perhaps) and the other teacher working at the opposite end of the room with the other part of this class. They change back and forth in order to develop the skills of the children to the best extent possible. At the time we were in Denver having a community group meet and study to make recommendations to the schools two years ago, there were some visiting teams and I was on one that went to Fairview school which is in the area that was flooded in 1965. They had had a great deal of team-teaching down there because they are a school of disadvantaged children and needed all the extra personnel they could get. This particular fall that we were doing this visiting the enrollment had fallen sharply because of the flood and many families had had to move, so the team teachers had spread out into separate classrooms. It was quite interesting to find that they liked very much having their own particular classroom in which to work rather than doing this in one room, and they had become much more enthusiastic about team-teaching. I do not know whether others have had this experience or not, but the principal explained to us when we were on this visiting team that there are certain disadvantages in working in the same classroom.

Referring to our aide situation, one of the reasons we took into consideration in deciding which of the thirty people in Denver would have the speech aide, one of the young women who wished to participate in this is in one of the schools where she has always had quite a large room. We considered this quite an advantage because sometimes speech folks are working in little, tiny places, and it is a little more difficult if you are trying to divide the activity.

Related to having all of these things going on for children, we have a great deal of administrative personnel in schools and related to schools. There are principals of schools as there have always been, and I suppose always will be; and assistant principals sometimes. We have an assistant principal at Evans school because of our complex operation. Sometimes there is a teacher assistant to the principal if there is not an assistant principal. This is a teacher assigned, by the day, to work in the office for the year. This person does not have status or administrative authority but assists in the ongoing operation of the school. It is always rather interesting when you first have one; and this job is one that helps teachers understand the over-all operation of a school. I began this fall with a new assistant principal because our former one was promoted and is now a supervisor in the special education office downtown. For about the first three months, assistants come in every day and say, "I had no concept of what there was to be done here." I am sure that it is pretty much the idea of classroom teachers that they could walk in in the morning, shut the door and teach the children, go home again at night, and it would not make much difference whether there were any office personnel or not - but it makes a great deal of difference. However, the difference should be for the good of children and this is one of the things that I really had fun teaching our secretary (I still have the same secretary I had when I started as a principal fifteen years ago); there is always concern in the office of the school when a teacher does not add up a column of figures right, you know. It seems an odd thing when they are supposed to be experts. In the eyes of clerks and secretaries, I imagine they are supposed to be experts in just most everything; but they do make mistakes in reports and so on. I noticed as I began work as a principal, the irritation that was reflected by tone of voice and so on when the attendance report or the register came in and this or that clerical work was not just right - a perfectly natural thing. Here is a clerk or a secretary (we have both in our building) who earns far less money than a teacher, but who can probably do this type of work in an extremely accurate fashion and who, naturally is pretty peeved at the idea of a report incorrectly added so when she puts a number in her report things do not come out right and she has to go back, etc. It was quite interesting but it did not take long (because we have a wonderful secretary) to convince her of the fact that teachers are always doing this kind of thing at the end of the day.

I think that teaching when it is well done, whether it is a small or a large group, is one of the most beautifully creative pieces of work that can be accomplished. When a group of children can come into a classroom, participate in the activities, learn and have a happy day with very little strife, everything works out so the material in various subjects is being covered, then something has been accomplished. They come to the end of the day feeling that they have learned - and the teacher has accomplished what her plans for that day indicated she wanted to accomplish. It takes a very masterful person to do this in the best possible way. At the end of this creative job that takes so much from her, she is tired. Then she sits down to add up the columns of figures and they do not come out so well! This is merely an example of the sort of "give and take" which has to go on in understanding the other fellow's work in a school situation. The fact that we have to be ready to look at what he is doing is just as important as what we are doing.

Teachers, you know, are sometimes a bit inclined to think they know the best way to do things. Of course, many of them have spent all their lives in the classroom, first on one side of the desk then on the other; and they are telling people what to do all day, and sometimes they are inclined to tell each other what to do. This almost never works. Their way of doing it may be better, but the other teacher is not particularly interested in this; so it takes a little sense of humor and quite a little getting along together to have things go well in a school, and to be sure that we do our own particular job to the very best of our ability and not become too concerned about how the other fellow is doing his job.

Now, coming on down the list of personnel after teacher assistants or assistant principals, we have the social worker in the school who may be full-time if it is a large school in a disadvantaged area, or may be only part-time. We have a nurse on the same basis, and a secretary and a clerk. We have access in school these days to the psychologist who is also assigned part-time; perhaps not as often in many on-going schools. We have the psychologist if needed every Monday morning, but usually he is not needed that often in most elementary schools. Here are all these people who are in the school full-time or coming in part-time, who help us in this business of looking at children individually and seeing what can be done to make it possible for them to learn the most. That is what we are after.

Then we have either coordinators or supervisors in downtown offices who also aid in keeping programs running smoothly, the essential aim always being: "What can we do or create which will make a better program for this child so he can learn the most?" Our coordinators in the Denver Public Schools are master teachers who come in and observe teachers and teach for teachers and confer with teachers to aid them in doing a better job. They work with the new teachers about once a week and try to see second-year teachers twice a month. The third year, while a person is still on probation (before their tenure, as we say), the coordinator is on call in most cases, although some teachers have regular schedules. These coordinators endeavor to raise the level of teaching in the classroom; they have nothing to do with a teacher retaining her position. This we think is quite a wonderful part of this operation, because they have no supervisory work so far as forcing a teacher or having anything to do with whether she has a change of assignment or is terminated at the end of the year. This was the suggestion of Dr. Oberholtzer, our former superintendent of twenty years. We have had about fifteen or sixteen coordinators to provide helpful personnel for teachers and for the ultimate good of children in as relaxed and easy an atmosphere as possible. Of course, you remove as much of the fear element as you possibly can in letting the teacher know the coordinator is not going to talk with the principal about how she is doing (we have no communication with these people). We may say to them, "Wonder if you have so-and-so reading outlines that were developed a couple years ago; could you pass some copies on to Miss Smith down the hall?" They may suspect that you have been in to visit and you think their reading instruction is a little weak and you would like some extra help, but there is never any personal discussion between coordinators and principals. So we think it is a good system to aid teachers to teach their very best.

Teachers are very much in demand these days. Teaching is very hard work, as I have pointed out, and if they get to the point where they can do it in *a very masterful way it is easier for them. Any job is easier the better you do it and the more you put into it. So if they can become master teachers and really learn techniques going along in good fashion, it is also better for them as well as for the children.*

It is rather interesting, too, to think a little bit about the development of materials these days - guides in school work. There are all kinds of work done in any school system to develop materials that may help teachers, and in these days of access of federal funds there are many helps being worked out for teachers. In the Denver schools we do our guides almost entirely by having teachers work on these during the summer. We think we should have guides that come from close to the classroom. We try to re-do our guides about every five years and keep up-to-date on our curriculum; of course, there is only so much money allotted for these things.

Mr. Lloyd Jones is our Director of Instruction at the elementary level and of Special Education. I remember hearing him tell about three or four years ago about attending a national meeting of Directors of Instruction and he came back and said: "I am so glad that I work in Denver. At this meeting we were talking about curriculum and how it was developed." He took out his notes and made all kinds of quotes: In so-and-so city the first week in May in the second grade, they will be studying butterflies. He went on down the line and gave us a list of about twenty-five of these. The system in these cities (and it represented many cities throughout the country) was for a few people at the administration building to sit down together in a little cubicle for however long it took to decide what materials should be covered then to come up with a very organized way of getting through this material. We in Denver (and any schools I know of in the Denver area where you will be working) would consider this a ridiculous way to get things done. All it takes is good organization to have an elementary school run well, but that is a little too much organization. We like to develop our guides and our instructional material by having teachers work on them together with help from downtown personnel who are specialists in subject areas and, very often, we call in consultants from other places in the country.

Another thing that happens in our school system that is helpful is that we have a good many little booklets of one kind or another which point up some of the important items about things that are going to be part of a teacher's job. There is one called, Parent-Teacher Conferences, Denver Public Schools. You might think off-hand, "Why do you need a booklet about parent-teacher conferences ?". But you would be surprised at how very helpful some of these little guide-lines can be. For instance, if the teacher sees that the parent's coat is taken care of so that she does not have to sit in this conference and roast to death, the meeting will be much more pleasant and comfortable; with extraneous things out of the way more can be accomplished. This little booklet is full of little hints such as this to help make parent conferences as valuable as possible.

Sometimes I have trouble in my school with parents trying to have conferences with teachers outside the classroom while the children are waiting. A teacher needs to be prepared to go into a parent conference; she needs to think *over what she wants to say, what points she should make, and she does not have a chance to do this when Mrs. Smith accompanies Joe to school and comes to talk with the teacher two minutes before the bell rings and the other children are coming into the room. The parent and teacher stand in the hall and try to talk for the first five minutes while the class waits. This is too hard on everybody, and the teacher is not able to have a good conference. Naturally the teacher is trying to be courteous to the parent, but what the parent should really hear is how important it is for the teacher to be with her class every minute. Maybe the teacher has written several notes or called trying to get this parent to come, so it seems terribly important to talk to her then. The suggestions in these little booklets help the teacher to think of the importance of these things - not a part of actually teaching a child, but of making the very best of situations.*

We have a little system also in our schools of looking at the results of education every once in a while. Denver Looks at Its Schools and The Denver Public Schools Look at Themselves are a couple booklets that have been published. This we do every three years, so we can see what we are accomplishing. The Health Service puts out a pamphlet called Attitudes in Learning. I spoke a while back about attitudes and I do think they are very important. This pamphlet tells how attitudes aid children in learning.

The Role of the Speech Specialist in the Public Schools

Miss Lois Field

The term "speech specialist" which I noticed in the literature which Dr. Alpiner first sent to us is an interesting one. We have had such a time, as he stated earlier, deciding what we are going to call these people in the public school. I very much dislike the term "speech correctionist" myself, but we used to call them "speech therapists" and then we got into trouble with the American Medical Association and other such groups, who said that therapists are supposed to be working under a doctor's direction in a medical setting. We had to give that term up and there has been a lot of talk about it country-wide. I found this out in August one year when the principals came back to work about two weeks ahead of teachers. I had learned that we could not use the term therapists any more and I was writing bulletins of all kinds and I needed to call them something, so I decided to use "speech teachers" - and that was one of the largest mistakes in my career; they let me know this in no uncertain fashion. We have a wonderful group of folks and they are a delight to work with, but they certainly told me they were unhappy to be classified in this way! They felt they were not teachers; although, of course, they teach. They wanted a different term applied to them and this is with good reason. So we went back to what we used before "speech correctionist" - but I think it is really a poor term. We are not, as you will see (and I am sure you are going to have a very delightful experience) just correcting what is already there and is perhaps a little defective. We are doing so many other things in speech correction. And particularly in these days when we are finding out that, many times, children's problems are not as simple as we thought they were when we get to looking at the causes of some of these things. When we find there is some language disorder, there are some other things as well that you will hear more about as you go along during these three weeks. We have a job to do that is quite different from trying to teach Susie to say "rabbit" instead of "wabbit", because there is something else back of the thing. I like this "speech specialist", so if Dr. Alpiner does not mind we may, in the Denver schools, if the speech folk (we will so name them at this point) approve, so call ourselves in all the bulletins next year.

When it comes time to organize a program of speech correction, I feel the speech correctionist is up against the hardest two or three weeks of the year - because it is a mighty big thing to go into several different buildings. She wants to feel at the end of two or three weeks that she has organized in sensible little groups all of the children in these different schools that need her kind of specialized help. It takes some real doing, and it is one of the things that even those with experience sometimes dread.

The first thing that has to be done is some screening, and you are going to hear and learn a little about hearing screening. There are many times in life when we need to do some kind of a screening procedure to see where are the causes of the difficulty. We do our screening in the Denver schools at the second grade level. We used to do it at first grade and it was decided by the eschelon several steps above my position heading this program that we would change to second grade. This was several years ago. The correctionists at the time were very much disturbed; we had screened at first grade before and we wished to continue this - but we did not have a choice. We were not consulted. However, we feel better about it than we did at first because maturity does help, as you will be learning as you go along during this time of training. Children usually develop different sounds at different ages; many of the experts say, for instance, that it is perfectly normal and natural not to have a good "r" sound until age seven, so you wait to let maturity help you when you do this kind of a thing.

Now we also take children at other levels - but we see every second-grade child. The speech correctionist sees every second-grade child in the city during this screening process. The folks do it in a different way as far as the general screening is concerned; they have various little techniques for visiting with the children. They have the children come out of the second grade classroom a few at a time; in some schools they work outside the classroom door if there happens to be a place where there is not too much disturbance. Two or three children come at once; they talk with them about whatever they might want to in order to see whether they pick up some difficulties and learn then that they need to run a phonetic inventory on a child. We had a screening workshop in September. In the Denver schools we have educational planning week during Labor Day week. The children register on Wednesday morning, but other than that, we have the entire week for meetings and planning. A committee composed of the staff called the Principal's Advisory Committee came to me last spring and said that some of the folks felt they needed some help about screening. They wanted to set up a panel on this and Miss Penny Hinckley offered to take charge; she is one of our fine, experienced folks and she invited several of the staff to be on the panel. (She chose people whom she knew had a little different way of doing this and we turned it into a workshop; it was very helpful.)

When we find children that we need to check definitely, we all use the same set of cards. They come to us from the printer in sheets and we cut them up and many of the folks color theirs with colored pencil (crayon smears). This makes them more attractive to the children. Some folks mount the pictures on a little black kind of leatherette paper, and many of them use a notebook with rings so that they can be flipped over. But we are all using the same phonetic inventory.

The record card was developed by a committee of our folks who worked over quite a period of time. We have thirty on the staff and on some things there were thirty different ideas. This is healthy and good; a committee should always have a little bit of a rough road to finally come up with a program everyone will agree to. We are going through this right now as to a speech report card. When we were going to have a new superintendent, they asked last spring if this would be an excuse for having a new speech report card to send home twice a year. Well, our new superintendent, being an economical fellow, did not have new cards printed; he had the former superintendent's name blacked out and his put in at the side - so we did not quite have an excuse. However, I said, "Let's go at it anyway. The card we are now using was developed through the work of a committee several years ago, but now there are many things we do not like about it. So we will develop a new one." This last Wednesday afternoon the committee made its preliminary report. They had worked so hard, only to be told, "this, and this, and this, is not the way to do it". This is the first stage of everybody mulling it over. So it went with the record card till we finally came up with a card we felt would record the necessary information in an easy to read manner. We do feel that there is a great advantage in having the same record card used in all the schools, the same set of pictures, etc.

We are quite individualized in our program so far as most of the operation is concerned. This is because these speech correctionists have been trained at various colleges, and college programs are quite different. I think that people, in the main, are much more comfortable if they can go ahead and work in the way they have been trained. I do not say we never ask them to make changes if there are certain things that are too distressing to us, but in general each speech correctionist goes about working with the children in the way she feels most comfortable and as she was trained. We do not have a great many regulative procedures; but as far as the inventory is concerned we do all use the same record card. Of course, it is obvious why we would do this; children transfer to different schools and it would be too confusing if we did not have the same record.

We also check children at any age level when they are referred by the classroom teacher, by the principal, or by any other school personnel. Sometimes it is the social worker or the nurse who, early in the year, is having a visit with a child and sees that he has a speech problem. The speech correctionist checks. In setting up the classes they enroll first the children at second grade level and above. The principle back of this being that we do not want them to get out and away from us and off to junior high because there is no program at the junior high level, so we take those children first. We have one principal in Denver who calls me up (usually every year) and says, "When are you going to get this program organized so that you take the kindergarten children and get their speech made perfect before they go in the first grade?" This is his great song - and then if you do not get it done, you do it in the first grade while they are learning to read and while there are so many repetitions. Then by the second grade level and from then on you would not have anything to do. Well, we always talk about it and that still is not the way we do it - but there certainly is much to be said for this. Of course, there is much to be said on the other side of the coin where you are waiting for the natural growth as they get older, and for maturation to help you.

If we have space then, we take children at first grade and kindergarten level - all extremely serious cases anyway. We try to catch all of those. Our folks work now with 125 children a week; that is, not over 125. We are the black sheep outfit of the state - I guess that is what you would call us. The state requires that speech correctionists work with from 70 to 90 cases a week - not over 90. This is in a handbook. At the time they first put out this handbook, it said 70 to 100; and at that time we were working with 185. So they really went after us - and of course they have a right to because they pay a part of the speech correctionist's salary. They began to put teeth into what they were saying to us. Our executive director of special education, who was then Mr. Russell Britton, (since retired) had some meetings with the state department people and came to an agreement with them. We would add two speech correctionists a year for five years, merely for the purpose of cutting back-load. We would add others if we needed to because of new schools opening. So we have come down now to 125 children a week for each correctionist.

In going back to the business of taking the more serious cases, the correctionist can perhaps make some deviation between schools. I mean, here are some children in this school that should be taken at first grade or kindergarten level, but they are not as seriously impaired as at another school so "I will take these instead", because that makes a total of 125 out of all the schools in which the correctionist works - which may be three large schools, or it may be as many as five schools. I believe we have one on the staff who has six different schools this year.

The groups are never over five - usually three or four in number. Generally speaking, we do not work with individual cases out on the itinerant schedule because of our clinic program, which I want to describe also. Sometimes we do; it is up to the speech correctionist to figure this whole thing out and how everything fits together; but generally speaking a child needing individual help should be in a clinic situation rather than in the itinerant situation. So we try to get that job done instead, maybe in between time and if we have space in the program, then we can work with this child individually. We are inclined to lean toward the principle that public school education is group education. This does not mean that you do not work with children individually - of course you do, and particularly in the field in which you have now entered as an aide. You are doing a great deal of individual work, but there is another child or two there; and there is a certain premise in this that we are still inclined to think is perhaps a right premise from which to work: if children are too much in need of a one-to-one relationship without other children present then this is perhaps not the work that we do in public schools. How much of this we may change in our thinking as time goes on, I am not sure - there certainly is something to be said for this. But when all is said and done, it is the tax payer's money that has to stretch to meet the bill. You have to keep this in mind.

I want to speak of time periods too, before I go to the clinic. This is a place where we have to consider the organization of the school as we talked about in the first session. In a platoon school where periods, for instance, are 25 minutes long, the speech correctionist needs to have the periods 25 minutes long because it certainly is not a workable thing to have Johnnie be half-time out of arithmetic and half-time out of something else. Generally our periods are 20 minutes or 30 minutes except in a situation of that kind - and the period depends on what the correctionist feels is the need in setting up the program. I think 30 minute periods are particularly great in schools of disadvantaged children because they need some of the little extra things that you can do. You can spend a little more time on some of the things that might border on the area of speech *improvement, etc., which are a part of the picture. So I like the 30 minute period, but this is up to them to decide.*

Now about the clinic plan that we use in Denver. This is something we devised some years ago (10 or 12, I think) to try to take care or our more serious cases. Denver has been a very rapidly growing city - the third most rapidly growing I believe I read last year when the statistics came out about cities. When cities grow very fast they cannot always keep up in all of their specialized programs. Dr. Oberholtzer made it quite clear to us some years ago; we grew so rapidly during his regime we doubled our pupil enrollment in Denver. He said we could not possibly have the additional nurses, speech correctionists, etc., to do the job. We would try to increase these as we could, but money was one problem, and there were many problems. We could not have as many additional special people as we could have classroom teachers. We had to have the classroom teachers and we work in the city on a ratio of about 30.5 - in Evans school a ratio of 18 (by this we mean this many children per classroom). If you have a ratio of 30 per teacher you may have some classrooms that have 35 or 36 and others that have 24 or 25. In our school we work on a ratio of 12 points below the rest of the city because of the integration of the hearing-handicapped; so we have some classrooms get up to 23 or 24. But when you work on a ratio and you have 1,000 new children appear in September, you have to have so many new teachers, don't you? But you can get by without as many new nurses and as many psychologists, etc.

This is really one of the reasons we started a clinic idea. We have five clinic schools in the city and if a speech correctionist finds a child who should have speech every day instead of once a week, they may recommend that the child be transferred into one of the clinic schools. In most schools the correctionist sees a child once a week; in the clinic schools the child has therapy every day, sometimes twice a day. We have two clinic schools that are part-time (the correctionist is there every morning) ; at the other clinic schools the correctionist if there all day. Evans is a full-time clinic school.

The child then goes into the school by school bus, has an early morning period in every case (except the Goldrich clinic where the busses come at the same time as the regular school). The speech children come in on the bus early. In our case we have our audiologist and do some dividing of time in the early morning, so we pick up to 30 children, although there are not more than 15 in the session. This is a group session for perhaps an hour, depending on when the bus comes. Then the child goes to his regular grade in that school, and during the day comes out for additional work with the speech correctionist. Here we do needed individual work. If this is a cleft palate child where we have organic problems he does not have any business being in with other children; he needs very specialized work (unless there are two such children - they may be taken together). This is where we think the individualized work is just fine. However, there still may be small groups of two or three, depending on the situation because the good old rule of competition, I guess, is maybe what has made our country what it is. It certainly works with children too, although it may be individualized work. We feel that this clinic placement of more difficult children plus the fact that correctionists do have the services of nurses and social workers to do some of the things they might have to do themselves in certain outlying communities has helped pull our load down pretty well. We rather like working with a top of 125; some of our people have only 100 to 110.

I do not know what the state department will say. Mr. Wiggins can go back and tell them we are down this far now. This is the fifth year of the five-year agreement and maybe they will come along and want to start another one with us; but those things are arranged above my position so I just do not worry about them. Of course, if it comes out that speech correctionists have an even smaller load, I am all for that.

We have found this type of clinic really is a very successful way to handle more serious cases. We can have much more parent contact in the clinic. They take a tremendous interest. It would be interesting for you to see a few of the clinic report cards when they come back with the parent comments - they are wonderful to read. The thrill they have and the tremendous participation that some of these parents will take in the program with their children! When you do have the clinic and it is just in one location, everything is there and you have a small number of children (even though they are more seriously handicapped), you can accomplish a great deal. This relieves the itinerant correctionist from more serious cases to be worked out along with others on the schedule. There are one or two of the correctionists who feel they miss what they sometimes call the "juicy" cases by our having clinics, and they are a little disappointed about this. If they feel extremely able in the area of working with the most difficult children (and speech correctionists are just like all the rest of us in that we feel more able in certain areas), they miss them on the itinerary schedule. That might be one little point, perhaps, against the clinics.

I probably have just about time to mention the parent permission letter, which is a part of the business of setting up the program which we have been talking about. In this letter we endeavor by means of eight questions and answers to acquaint a parent just a little with what we are doing. We do not take a child in speech correction unless we have the parent's permission. This sometimes has an unfortunate quality to it, but we feel that it is necessary because of the fact that speech correctionists are working in a different way than classroom teachers. There is much close contact with the child; they may be doing kinesthetic and manipulative types of procedures with the tongue blade or something else - maybe a piece of a tongue blade little swab stick to try to get an "s " coming out through the center, and so on - and difficulties could arise. I do not mean that this sort of thing is covered in the letter, but because there will be a different type of relationship and of activity between the correctionist and the child, than with the classroom teacher working in the group, we feel that parent permission is essential. Then, of course, we hope that the by-product advantage is that the parent realizes that this is something very special and, therefore, begins to be more interested in the program and will cooperate with the speech correctionist. The correctionists are unassigned for therapy work on Wednesday afternoons so there is more time for parent conferences. We hope they will be willing to work with us in this way.

The questions are, "What is speech correction?" "How are the children selected for speech correction class?" And the answer is here. "Will your child outgrow his speech problem?" "What can the parent do at home to help the child with his speech?" "Will the speech correction class interfere with your child's classroom activities?" "Will your child be self-conscious and feel discriminated against if he is enrolled in a speech correction class?" "How will you know what kind of work your child is doing?" "Is there a charge or special fee if your child attends a speech correction class?"

And then a little paragraph is included about additional questions. Usually people are pleased to have this work, but sometimes they do think it is a reflection on their child that he needs speech work. Then we try through a joint conference with the principal , the speech correctionist, and the parent to at least persuade the parent to come to visit a speech correction session or two. Usually after they do this and see what a good time children have and how much they enjoy the work, they are willing. But, as in all things we cannot always bat 100%, so occasionally we have children we cannot take because we do not get the parent permission and we feel it is extremely important that we have it.

As we look at this program as it is set up and going, the important thing that we come to next is the fact that the speech correctionist is part of a team trying to do something for children. The principal is the one in the school who has an over-all view related to everything that might go on about a child; and in the Denver schools should there be an issue over whether a child is or is not to be in a speech class, the principal makes the decision. Now 99.44% of the time there is no need for the principal to be involved. Speech correctionists are respected for their ability and they are the ones who are knowledgable in the field - but sometimes there are special situations. For instance, it will come up occasionally in the matter of dropping a child. The correctionist may feel that this child has attained as near correction as he is able; maybe he should drop out and try again next year; or maybe she thinks we have come to the end of the road in what we can do. There may be some particular reasons related to the family situation, the total school situation, the kind of people involved, or other factors where the principal would feel that it would be wiser for the child to be held in a speech class for a little longer. I am not sure whether this is true everywhere - and I see some defects in this, but usually the matter is not abused. However, this is the procedure if it becomes an issue.

I remember a speech correctionist that we had about four or five years ago who wanted to have a graduation program for speech children at the end of the year with caps and gowns. She and the principal just about came to loggerheads over this. She had read while in school the Life magazine article about the kindergarten class that graduated in caps and gowns; and she had gotten the idea then. She was a young person and felt very bitter about this, because she felt her desire to make the most of her program was being interferred with. Of course it was, but nevertheless the principal had to win. But I think this was right - it was not quite the appropriate thing to do, although it all was part of the team approach idea.

I want to speak also about the Health Services Department of the public schools related to this team and how we work together and how we give in to each other on what needs to be done, and the ways we proceed. We have the Health Service Department operating within the public schools and it is a part of the school budget. We do not use the county health nurses in this kind of thing as is done in some of the outlying communities. The Health Service Department, being well staffed with fine doctors, has many ideas on the way they want things done. For example, speech correctionists do not talk directly with doctors about children. If a speech correctionist wishes to have some additional information from a doctor, she talks with a school nurse in the building and makes her needs known. There is a form the nurse fills out and sends downtown. It is the nurse's privilege, and the speech correctionist's also, to call the doctor and make any additional facts known to him. In all of the special education cases, the doctor is Dr. John Lampe of the Health Services Staff. Dr. Lampe may call the family physician and get the required information and send it back. Reports from evaluative centers and many places that are doing work-ups on children may also be contacted. These reports go downtown to the Health Service Department and are eventually filed there. They come out to the building; we can use them as long as we wish; we can ask the Health Service personnel to help interpret these reports if they need interpretation. They come out and are glad to do this, but it does have to be handled in this professional fashion. Sometimes this is a little disturbing to some people; but it does keep the thing from happening that can happen when a teacher might say to a doctor, "You ought to give Johnnie a tranquilizer because you ought to see how active he is in my classroom". Of course, this is beyond the premise of a person in education. It does not bother the doctors to tell us what we should be doing in education (as in the case when we had blind children at Evans, and sometimes they would tell us whether the child should be reading Braille or large ink print). There is a tendency of this kind when you have a real team approach toward getting the best for a child and you are using the combined knowledge and work of each specialist so that the best thing is done. We must respect each other's disciplines and operate in a professional way.

We have had, interestingly enough, a bit of a problem this way sometimes when we have a new audiologist. We have our own audiologist who works half-time doing testing and half-time teaching lip reading and doing the auditory training work with the hard-of-hearing children in the building. When an audiologist comes out of a university setting, he may have just been in training there, or if he has worked there, he has different ideas than what we are able to do in public schools. We had an audiologist who was new who was overstepping the bounds, telling what should and should not be done about whether people should or should not wear hearing aids and what evaluative centers were not to his liking. etc. When I asked Dr. Lampe to hold a conference with him to help him understand, he said, "I know what you are talking about; I have Denver Public School nurses new on the staff this year who have been working in hospitals and I am having a time getting them to understand that they can say certain things as a member of a hospital staff that they cannot say as a nurse operating in the public schools." This is a part of what has to be learned and considered as you work in a public school setting. We have a fine reputation in our speech correction program in the public schools so far as the principals and the other members of the schools *are concerned, partly because we have stressed this kind of thing. We may feel ourselves specialists, and speech correctionists are inclined to come out of college feeling they are made of a little different clay because they are speech correctionists. I am sure none of the colleges here represented are part of this, but from back East and other places this sometimes happens. If you have this feeling within yourself, you react in this way when working with other teachers. So sometimes we have some work to do to get these rough corners smoothed off. We are to be proud of our specialty and what we can do in it; yet we must see that we do "get along" and that we do not "feel our oats", as it were, with other members of the staff. Because we have been fairly successful at this, we are rather well-known for it and the way I know it is that people sometimes forget I am there, then they look around and say, "That's right, Lois, you're here. You are hearing this aren't you?"*

They will say in area principal meetings or committee on instruction groups or various places (I have heard it maybe two or three dozen times in the last three years) as something comes up where problems are being worked on: "Wish the instrumental teachers as they go about the building would do more like the speech correctionists do. The speech correctionist keeps in touch with me; I know what he is doing, and he does not sally off on tangents of his own." About this point, someone will say, "That's right, you're here, aren't you, Lois?" We have worked hard and our staff now is very proud of the fact that they have this kind of a reputation in the city. Of course, it makes their way easier because when they do feel the need to speak and say, "This is the way it ought to be as I see it". Even though you do not quite see it, more times than not they come out feeling they have made the decision because of the spirit of the thing.

We try to take the responsibility, if we can, for getting the children to speech class. This is a difficult thing; unless you have been a classroom teacher you just cannot know what it is to keep such an operation going smoothly. A teacher cannot look at the clock and remember that at 10:02 or 10:00 o"clock, Johnnie and Susie go to speech, so we try to have little devices to help with this. Some correctionists put up little speech clocks in the classroom that day with the hands indicating that speech is at a certain time. Some have individual books for the children and put the speech clock on the book so the child helps to watch the time. The device is not important but the spirit back of it is important. The speech correctionist, if she has a group just ahead of the last group and there is not a planning period in between, sends a child to get the next group. She teaches the child how to do it - to step quietly into the classroom rather than to burst in and say, "It's time for speech", so that whatever the teacher is teaching is not interrupted.

The way we work among other people and our general attitude around the building has so much to do with the acceptance of our program. We think it is very, very important that we build that kind of feeling in a program. We sometimes get some extra helps and I would like to close by telling you about one that has helped our program a great deal which was developed by a principal of one of the Denver schools, Mr. Wills, who had great admiration for the program.

He called me on the telephone one day and said, "You know what these speech correctionists ought to have? They ought to have a moveable speech mirror on legs with casters so that it could be moved around. There ought to be a blackboard on one side and a mirror on the other, so that the correctionist would always have a place to put eraser and chalk, could flip it over and have the board, flip it back for the speech mirror. If the speech correctionist had to change locations during the day, or if she was working in an odd little room with no blackboard, these items would always be right there when most needed."

We worked on this and have now sent this plan for a speech mirror to forty-two different cities in the country. When speech correctionists have left us, married, and gone to another city (often they go to work at least part-time) they often write back and say, "Could I borrow the plan for the speech mirror?" This was developed and built in our own shop. It is just one good example of what can happen when you give the people among whom you work a good feeling about your program. When you do your work to the very best of your ability every day and create a good feeling, then somebody who does not know anything about speech but who is interested in you and your program may do something that, in the end, helps hundreds and hundreds of children.

Professional Responsibilities and Code of Ethics

Daniel R. Boone, Ph.D.

I cannot say without using too many words what a thrill it is for me to be here on this first day of this training course with you ladies. We were talking earlier today that it was just a year ago when this was in the planning stage and people were meeting almost every other week trying to decide what we could do to get such a program as this started. I do not think anybody anticipated at that time that we were going to be able to come up with such a fine group of people to begin with. We just really did not know the dimensions of the problem that we would be facing in working with the speech pathology aide and it looks like we are off to a very good start.

The Congress of the United States in 1966 met and came up with this bill called "Title VI, Education of the Handicapped Child", and created for the first time within the Office of Education in Washington a Bureau of the Handicapped. The Bureau of the Handicapped issued a challenge, really, to the state departments of education around the country and said, "Let's be innovative; let's think of some new approaches to help the handicapped."

Our first thought was that we ought to hire more speech pathologists; we ought to have more speech clinicians in the school systems, so we could deal with smaller case loads and perhaps be more effective. We sent inquiries around the United States to various departments of education and found that there were job vacancies for 30 to 100 speech clinicians in every state; the training institutions in the country just were not turning people out quickly enough. So the idea came about that they were using aides and assistants in other professions and that perhaps we could do the same thing in speech correction. That is really how this came about. Now as an aide to a speech correctionist - or if you use the terminology of our professional group, The American Speech and Hearing Association, the speech pathologist.- I think you have to have some appreciation of what the speech pathologist is. And I think when you realize what his or her training is, you will find the challenge of the particular job that you have to be very great.

The speech pathologist is working with people who have various kinds of communication problems. You know there never was a time in our history where communication was more important. There was never a time when deviant communication was more penalized. The child today who says "wabbit" when he means to say "rabbit", if this misarticulation continues throughout life, may have a serious handicap in getting higher education and in getting some kind of a job. The problem of stuttering - it is a horrendous problem - how do we correct this disorder? We have voice disorders, hoarseness, aspirate, airy, breathless kinds of voices, voices that are not up to the task presented to them. We have language problems: children who have real difficulty understanding what is said *to them, even though they have normal hearing. It is not only the children who may have these problems of articulation, rhythm-rate, voice, and language; it goes on through the adult years, as you all know.*

Although we have more speech correctionists in the public schools than anywhere else, we have thousands of speech correctionists or speech pathologists in rehabilitation centers, in hospitals and programs of this type. Now you will be working and training particularly to work in a public school situation, but I am going to talk about the speech pathologist. I am talking about a professional person who can work, with his certification, in the public schools, in the rehabilitation centers and hospitals, or in university clinics.

I joined the American Speech and Hearing Association after I finished my bachelor's degree and this was during the Korean war. At that time (in 1951) we had just a few members, less than 2,000. The American Speech and Hearing Directory that we put out last year, 1967, lists almost 14,000 members. Our growth in the brief time I have been in the Association looks like this: it was not until 1962 that we had 10,000 members. You take 10,000 bona fide clinicians and spread them over 50 states and you see the problem we have in providing intensive therapy often enough for the people who need it. So the real reason we are all here today is to try to broaden our service so that we may reach more people, because there are a lot of people who desperately need our services.

Today we have about 14,000 members in the American Speech and Hearing Association. To become a member of this organization you have to have a Master's degree or its equivalent, which means a Bachelor's degree with probably one to two years additional formal academic exposure. I would like to just talk briefly about the education required to become a speech pathologist. I am basically a teacher at the University of Denver, working with undergraduates and graduates who are taking work to become a certified speech pathologist or audiologist. The first two years of college require a broad background in basic sciences, some exposure to a general liberal arts curriculum, but a fairly heavy background in such things as biological science, physics, psychology, and this kind of thing. Toward the end of the undergraduate years (maybe the third or fourth year) the student has his first exposure, really, to the field of speech pathology. And after receiving his bachelor's degree, the way recent certification procedures have developed nationally, the graduate is virtually unemployable as a speech clinician or speech pathologist because, in order to receive his certification, he has to have the Master's degree or its equivalent. So at the undergraduate level in speech pathology, using our own program as an example, we want our students to learn how to listen and to learn how to look; and the students will spend literally several hundred hours listening to audio-tape recorders, watching television screens with video-tape recorders, listening to children and adults talk, listening for the problem areas, and watching and hearing the clinician in action with particular children.

After they have this listening-watching experience, our undergraduate students help out in our clinic and they usually are assigned as assistant clinicians to someone who has a little more experience. Then when the student *comes in for his graduate training, at this level he has to have so many specified hours working with children who have articulation problems in the pronunciation of words; he has to have some exposure with children and adults with voice problems; he has to have some background in stuttering; he has to have exposure in various areas of language disability such as those related to mental retardation, to deafness, to emotionality problems, to brain damage. He also must have some experience working with adults who have the problem of aphasia, the language disability second to brain damage. So in addition to his formal class work, which is the only time we can delve into theoretical aspects and try to learn something about the research of our profession, he has to have extensive, supervised clinical practice.*

Now after receiving his Master's degree, let us say at CSU, DU, or CU, he would then be able to take his first job. If he were interested in a career in the public schools, as part of his formal college training, he had to take a prescribed number of education courses. In the State of Colorado, for example, we have several types of certification certificates: one being Type A and another Type E. He will qualify for these by meeting the requirements of the School of Education where he attends. They will usually require some time in a public school, which is not surprising. One of the best ways to learn about public school speech correction is to work at it in a public school under the supervision of someone who already has the clinical competence. If, for example, he wanted to work at a rehabilitation center or a hospital after he received his Master's degree, hopefully he would be in a program which would have some affiliation with rehabilitation centers or hospitals where students can go for some of their practicum experience.

It is my own belief, however, that the best speech pathologists, the best clinicians, are those who have had a real exposure to the clinical process. He really knows what the clinical problem is; he knows therapy techniques and is less setting-oriented. My own training was as a public school speech correctionist. Before I ever took a job in the public schools beyond my student teaching, I began working at a hospital in Long Beach, California, dealing with injured World War II and Korean War veterans. Most all of these boys at that time were 19 and 20, very similar to what we have now in VietNam, who had extensive head injuries and lost their language and speech because of these head injuries; fantastic, fascinating work. My preparation had been for public school speech correction, and I must say, for several months on the job I was most inadequate for the task. It does not take too long, if you have a sufficient amount of training, to adapt to a particular setting. After that I went to graduate school in Cleveland Ohio. We had a large community clinic where the students (this was the day before Federal grants) worked 20 hours a week in a clinic. They would pay your tuition and give you enough money to buy a sandwich. I worked there three years at the Cleveland Hearing and Speech Center.

I then went to a hospital in Cleveland and headed a small program there for four years. There I dealt with chronic diseases; people who went through windshields in automobile accidents, stroke cases; we still had some residuals of bulbar polio, this kind of problem. I then went back to the university and *was a director of a university clinic program and also taught. I then went to a medical school and taught for three years; and now I have been here in Denver a year. I mention these different settings because I think the kind of training our people are getting today - intensive training - specific to being a clinician - enables them to move from setting to setting with but little modification. Of course there are going to be differences; but it is no more difficult to work with a classroom teacher than it is with a plastic surgeon. It is no more difficult to talk to the school janitor that it is to a hospital orderly. All of these require some tact and respect for the other individual and what he is contributing to the particular problem.*

I think after a Master's degree today in speech pathology, or its equivalent, that you are dealing with a competent, professional person. This person still does not have his certification through the American Speech and Hearing Association; and in order to have this he has to work one year on the job under supervision, and following this year he has to take a clinical certification examination. This is a half-day written examination which he passes or he fails. The people that you work with in the weeks ahead will be people who have gone through this particular process.

Our attempt to increase the educational requirement for the speech pathologist, to require the supervised clinical practice, to have the written examination, is to provide the public - children and adults - with competent, professional speech clinicians. That is the only intent. The individual, upon successfully completing his examination, then becomes a certified member of the American Speech and Hearing Association, which is still not required in many school systems at this particular time. After 1970, which is approaching quickly, this will be required. A clinician in speech pathology will have to have, in addition to what his own state requires, national certification by the American Speech and Hearing Association.

Now because of the tremendous growth of our Association (in 16 or 17 years we have grown seven times over our size), we are a mushrooming, young profession; and because we are, we have three journals at the present time, all put out by the same Association. The first one (you will want to become familiar with some of these as I am sure you will find acticles in them of use to you in your clinical work) is the Journal of Speech and Hearing Disorders. This journal is constituted today to include clinical articles. There is an article, for example, called Semantics of the Voice by a laryngologist in New York City. He merely is saying in this article that the words we use about a voice carry more meaning than what the voice itself probably really means. Another article is Communication Therapy for the Autistic Child. Autism in children, as you know, is the inability of children to relate to people. It is a form of psychosis. Tremendous innovations have been made the past few years in getting autistic children to communicate. What does communication mean? An exchange of verbal ideas between two or more people. Autistic children do not relate to people and do not communicate. We have case studies in the journals: there is an article about a little girl who for two years could never use her *voice. A clinician wrote about the fantastic breakthrough they were able to make in this case. So we clinicians look forward to this journal which comes out four times a year.*

We have another journal which comes out four times a year which many clinicians do not look forward to as much, the Journal of Speech and Hearing Research. This journal attempts to ask a question about either normal communication or, let us say, pathological communication, and researches it. I recently had a study in this journal where we looked at how people with voice disorders hear; and we gave the old Seashore Test. Perhaps some of you remember it when you were children: how many beeps you hears, which one is higher, and this kind of thing. We found that persons with voice defects hear these non-verbal tones just the same as everyone else does. You might say, "Why bother to ask the question?" Because it was implied in our clinical journal in some previous research that persons with clinical voice problems were not as good at listening as normal people; therefore, you had better be aware of this when you work with them. But the basis of that conclusion was they had used something like 60 people with voice problems and they compared them with a normal population. You know who the normal population was? - Young college boys. The young college boys do everything better than anyone a few years older than that. So the Journal of Speech and Hearing Research looks at experimental aspects of the questions that we ask in our everyday work. In some of the districts that you will find yourselves in, some of the people with whom you work will be incorporating clinically some of the findings that have come out of investigation.

Then we have a third journal that comes out every month. This is called ASHA, the abbreviation for American Speech and Hearing Association. ASHA has more of an administrative kind of format. It tells us, for instance, that Congress passed Title VI. We found that by reading this back a year or so ago that the monies would be available. We read in this journal that Medicare is now going to include speech pathology services provided we go through a nurse. A nurse has to tell us when to go to work. Well, our national association is trying to correct this at the present time. Because of the great mushrooming of Health, Education, and Welfare, our national association is quartered in Bethesda, Md., right outside of Washington, D.C.; and our Executive Secretary of these 14,000 people is basically there as a congressional lobbyist. A lobbyist, as you know, is a person who goes to various committees and tries to get legislation favorable to whatever group he is lobbying for.

Then we do put out the yearly directory listing all of the members of the Association geographically by state and by city, and this is very helpful to me in the kind of settings in which I work, because I have to refer people all the time - to maybe somebody down in Desert Hot Springs, California. I look up California and Desert Hot Springs and I find there is no one there; but then I look up and see that Palm Springs is near-by and there is a certified clinician I can pick. I refer my client to him.

Now in order to make our association work, to become a member, we have to subscribe to a Code of Ethics. If you are going to help me as a clinical *assistant, the mere fact that you sign on as my clinical assistant makes us partners in enforcing the Code of Ethics. My own interpretation would be if you would break the Code you would probably carry me down with you. The Code of Ethics of the American Speech and Hearing Association is revised from time to time and is included in our yearly directory. I want to stress, and to discuss with you, some of the ethical requirements that we, as professional clinicians, face; and we would hope that you, as our assistants, would help us adhere to this particular Code of Ethics. Again, the only reason we have the code is to protect the public. So I am going to list for you at this time some of the major items from the Code of Ethics. After each item we will have a brief discussion. This is one part of your note-taking in which I would like you to be an active participant. I want you to think of each one of these and write down grossly the ethic.*

The first major section is *Section A**: It says that the responsibilities of a member require that the welfare of the person he serves professionally be considered paramount. Now I do not want you to know that one "word for word". This applies more to us than it does to you, because you are basically going to be working as our assistant doing what we want you to do. This says that the member, to be ethical, must have as his primary responsibility the welfare of the person he serves. In other words, it is more important when we are with the child that he be the primary person - or persons. That is why we are in business. We are not in business to make a living; we are not in business to spend the Title VI funds; but we are in business to serve these children, and by our serving improve their communication lot. We must never forget that point.*

The member must follow acceptable patterns of professional conduct in his relations with the persons he serves. I am sure this will be no problem to this group. There are acceptable patterns of professional conduct in his relations with the persons he serves; and they spell this out in a little more detail. He must not guarantee the results of any speech or hearing consultation or therapeutic procedure. That means we cannot give any kind of guarantee to anybody, either written or spoken, expressed or implied. This does not mean that we do not explain to a child what it is we want to do clinically; and it does not mean that we do not say to the child, or imply, that by doing what we want to do in therapy that we hope to somewhat resolve his problem. We have to have some kind of forward direction in therapy. "Why do I have to miss music to come here?" "Well, because we are working to help you on these particular sounds." We might have to "sell" a particular child on his need for changing his speech. Perhaps at his age he could care less. But it does mean that we cannot imply to the child or to the parent, "Come on in for a semester of speech correction and your problem will go away." This we cannot do. Or, "Take this tape recorder, Mrs. Green, and work on it ten minutes every day and I think by April your voice problem will be banished". This we do not do. No one in psychology does this. A good physician does not do this. We do not guarantee that by doing what we have to offer, your problem will be banished from this earth. So, remember that. Do not make the mistake of saying to a little child, "Practice your word list, Bobby, and you will not have any more /s/ problems." Avoid such statements.

He must not diagnose or treat individual speech or hearing disorders by correspondence. This does not mean that you cannot write letters and follow-up on somebody you have seen previously. I do not think this particular ethic statement will involve you as an individual aide; but we do not handle speech correction by mail. Ethically it is a poor practice.

He must not reveal to any unauthorized persons any confidential information obtained from the individual he serves professionally without that individual's permission. This is a very important one. You are going to find that in the work you are doing in the schools, you will come across information about these little children and even their families that is relevant to the process of correcting an individual's speech. I will give you some examples: at the preschool level we have a lot of little children who speak in an infantile manner; they talk very immaturely. We could very quickly say, "We will take each one of these sounds and work on them individually." But more often than not, we soon find that this child with us speaks quite well, and that he is using this infantile speech pattern as a means of responding to the people immediately in his environment. When we find this situation, it is sometimes helpful to talk with the parents and find out something about the home situation, whether there are competing brothers and sisters, because if there are often the child's only defense is to speak in an infantile manner. Or sometimes we find, in our type of clinic, fantastic abuses of children. One of the first cases I saw at the Cleveland Hearing and Speech Center was a boy who had a severe stuttering problem. His mother said at the time of the interview, "He was playing catch with his father over the week-end and got badly bruised". I thought a ball had hit him. It turned out that the child was the ball and the father played "catch" with the boy, with his brother. Both father and brother were retarded - an unbelieveable incident. Now any information that we know about the child specific to his intelligence, health problem, or home situation, is information that we must keep confidential. One of the hardest problems we have with beginning clinicians is at the coffee hour. "You should see this kid I got; the mother is a real 'weird-o' and the father is up in Aspen half the time." Very unprofessional conversation. So do not allow yourselves the privilege of discussing your children with whom you work, outside of your therapy rooms, and then probably only with the school correctionist. Do not carry your case information home; it is confidential.

He must not exploit persons he serves professionally by accepting them for treatment where benefit cannot reasonably be expected to accrue, by continuing treatment unnecessarily, by charging high fees, etc. I do not think this will concern you directly. I am sure there is not one of you who would feel that after a three-week course and a little time out in the public schools that you will be doing private speech therapy on the side after hours. Your laughter tells me of course you would not think of it. I hope so, for your sake, and for the sake of the person with whom you work at school.

The member must take every precaution to avoid injury to the person he serves. I do not think this has a great deal of relevance to you, because I think you would, by your very nature, take such precautions. Of course, you are not *going to have the child do things in your speech therapy sessions that might injure him.*

Now the duties owed by the member to other professional workers are listed under Section B.

He should establish harmonious relations with members of other professions. You can do more to promote harmony (and I might say, more to promote dis-harmony) than you might think. We had the unusual opportunity today of having a principal of a school, plus a person who wears a second hat of being head of the speech correctionists and hearing problems in the city of Denver. So you heard both sides: you heard a principal and you heard an administrator of speech/hearing programs. I think that the programs in any city, in the school, in the hospital or rehabilitation center, break down because of a little problem we might label "Problem X". Problem X is a slight distortion that you might give in dealing, for example, with a teacher. Let us say that Miss Appleby is your clinician and you work closely with her. If you have a contact with one of the children's teachers and you say to her, "Miss Appleby gets annoyed with Billy coming late. Any way you could get him there earlier?" That is going to do more to destroy the relationship between Miss Appleby and the teacher than anything else that could happen. You will play this very critical role, and I think the best way to play this role in any phase of life is to do whatever you can to patch up a hard feeling rather than add a little fuel to the fire. I think one of the most amazing behaviors I see time after time are people who enjoy adding a little fuel to the fire. If down deep inside you think you might have this little trait, do what you can to subdue it because it could really destroy the therapy situation and maybe even our whole program. Do whatever you can to smooth over differences as they arise - and they surely will - during these times there will be tensions.

Do not feel that you have to know everything *about this field of speech pathology as a result of our little course here. Feel free to say you do not know when you are talking to the teacher. Feel free to point out your role as an aide and not as a speech pathologist or speech correctionist. I said earlier here this morning privately that it would almost take a program looking at this group to know who was the speech correctionist and who was the aide; because from a physical point of view, age point of view, and intellectual point of view, you all look equivalent. But you will find situations (and I am sure they will arise) where you could say, "Oh, I think that he ought to take home that word list and Mrs. Green said that if he does not take it home she may have to drop him from the therapy." There are all kinds of little twists that you can make - slight twists of truth; but if you keep paramount the idea of promoting harmony in a relation, give up a point now and then, maybe someone else is right - I believe you can and will live to the fullest this ethical responsibility of establishing harmony.*

The American Speech and Hearing Association member has to guard against conflicts of professional interest, which means he cannot accept compensation in any form from a manufacturer or dealer in prosthetic or other *devices for recommending a particular product. This applies, probably, more to the audiologists who could say, as a public commercial, "I recommend more XYZ hearing aids than any other brand." That would be a serious breach of ethics.*

Ethical consideration is that none of our members in private practice can advertise, other than a listing in the classified section of the telephone directory or a business card. We cannot run ads in papers: "Come to the Rocky Mountain Speech Clinic; we have special winter rates." They used to do that - not very long ago. It is in violation of our ethical code and there are no professional groups to my knowledge who do this. A good ethical dentist or physician is also prohibited from doing this. We want to make our service available from the point of view of being known; we want it to be known and have it freely available but we do not compete among our other members by advertising. They used to do this. We used to have some very famous ads pertaining to the problem of stuttering and there were several schools in the midwest who broke, literally, every code of ethics we have discussed. They advertised, they guaranteed cures, they charged outrageous fees, they talked bitterly about one another. We try not to do this.

We are also to help with the education of the public regarding speech and hearing problems, which means that we should participate on panel shows. We should be at PTA's. We should write articles for public consumption. We should be active in promoting what we do so that the public might be aware of what we do.

Now that will conclude what I have to say about the Code of Ethics. The speech pathologist, then, in order to perform ethically, has to adhere to this particular code and it forms a very small but silent part of his over-all obligation. You will find that the personalities of the people with whom you work will be as varied as the personalities of any of us here in this group. Some of the people that you are with will like to talk after the case is gone, after the group breaks up, and will detail with you lesson plans for tomorrow; others will be different. The thing that you should remember, regardless of their personality or where you work, is that your basic obligation is to help them. Your basic obligation is to work as a training aide for the speech correctionist. Now in the weeks ahead, in the next three weeks, your duties will be specified by the various other speakers. Thank you.

Child Growth, Speech and Language Development

David Yoder, Ph.D.

We now begin a discussion of normal growth and development. There is a chart, The Denver Developmental Screening Test, which lists according to months and years the specific behaviors that we are looking at: gross motor, fine motor activities, language, and the personal social growth. The developmental scale was developed by a physician, Dr. Frankbenburg, of Denver. This was primarily designed to be used by pediatricians and physicians so they could have some kind of guide for various developmental norms.

Various behaviors are noted. For example, the first questions asked are: "When did he hold his head up?" "When did he roll over?" "When did he sit along?" "When was he able to pull himself to a standing position?" etc. This goes up the development ladder and selects only those items which are basic. We may question the parent. Many of the things the child did during various ages are not remembered. Perhaps the only time when these are really called to the attention of an individual is when they seem to be outside of normal limits. In other words, if the child were not walking until he was two and a half or three years old, this would concern us somewhat. This would point out, for example, that the child is slow in motor development; certainly, maturationally, he is not up to the norm we would expect. If he is not doing these things motorically, we might also question whether or not he is operating within normal limits intellectually, whether he was within normal limits as far as speech and language acquisition is concerned; or whether he was within normal limits as far as social behavior was concerned.

I must also caution, however, that even though history of a given child may say he did not walk until he was two and a half, he was not toilet trained until he was four, or he did not way his first words until he was four, we should not jump to conclusions and say, "This is a bizarre kind of organism. He should be in an institution; there is something drastically wrong with him." There are many reasons why these things may have taken place, and we have to take a look at these factors too. When we look at developmental norms and we talk about normal development in behavior we often find, with students who have not had much experience with children, they draw improper conclusions. Last year, for instance, we were evaluating a three-year old youngster who had not much speech or language behavior. He was a very squirmy, wiggly youngster and after working with him for an hour and a half to two hours, he slung one leg over the back of his chair and was not attending to a thing I wanted him to do. One of the students commented, "Sure is a brain-damaged child." There was no more evidence of brain damage in that child than in my own behavior; he was what I would call a typical three-year *old. It pointed out to me, being unaccustomed to how children act, this student was picking out one little behavior pattern (inattention and squirmy behavior) as being something very bizarre. However, for a child of that age under the circumstances it was nothing unusual. We took time out and talked with the student about what we might expect of a three-year old - what he should be doing. The developmental norm helped the student establish a reference point. This is an area which we certainly need to consider.*

We also should remember that 'normal' is a span over a given length of time. In taking a look at gross motor behavior, we may say 'balancing on one foot begins at age three', but actually it is not until almost age six that 90% of the children accomplish this. You see that they have a period of time in which to develop. Simply because a three or three and a half year old does not balance on his foot for ten seconds does not mean there is a problem, because he has quite a few years yet before he develops completely.

Another point is that youngsters who do not have a lot of experiences during this early developmental period may not be as skilled in doing some of the motor activities and other tasks. The motor activities are varied experiences. They are related to learning concepts which we must have in our language and speech skills. We find that this is particularly true in a number of culturally deprived situations where the child is limited, perhaps to crawling around the house. What does crawling behavior have to do with concern about speech and language? We learn spatial relationships, for example, through crawling behavior. A youngster who has had the experience of crawling from this side of the room to the other for a period of months is not only developing good strength and muscles for walking later on, but is also beginning to develop certain concepts of how far it is from one side of the room to the other.

He is learning types of temporal or time concepts of distance; by crawling fast he can get there more quickly than when going at a slower pace. There is an object across the room that catches his attention and he crawls to it very rapidly. The rapid pace of the crawling cuts down on the time it takes to get there and all these are concept-building activities which relate to motor ability. These are cases we work with all the time. When he is in his playpen and there is an object lying outside, and he reaches for it, a gross motor activity of reaching down, picking it up with his hand, and pulling it back occurs; but it will not come through the bars. Now what does he have to learn to do in terms of the motor act itself? It is just a simple thing to you; if you reached down you would automatically turn it and pull it through the bars, but the child has not learned this skill yet. He pulls it back again, but still it will not come through the bars. Chances are he will yell and scream; you may come to his rescue and turn his arm for him, or you may take it from him, or push his arm aside and give it to him. He now learns that in that amount of space he cannot pull an object that large through the bars. So here is a motor task that he must perform in order to carry out a given activity. Some place along the line we have established a certain kind of spatial relationship which started many years ago which now allows us to make certain kinds of judgments.

The child may again, even after you have shown him, reach out for the object and pull it in. You may have to show him several times that this motor behavior is the proper one you want him to perform. Pretty soon he will begin to develop a concept, but at first, I think children are very specific in learning. He reaches out and pulls the object in; he does not get the idea right away, but pretty soon the 'light goes on' - concepts develop through many experiences and do not necessarily happen all of a sudden - they are built upon and take time and maturation and development of the child. The child experiences many things before these obvious milestones of developmental behavior take place.

We find that in youngsters where this has not been possible, particularly in cerebral palsy children for example, or individuals with some kind of gross motor involvement, where they have not had the experience of this simple little task of crawling around the house, that they are limited in the spatial, temporal kinds of relationships. Where he has always been confined to the bed, or he has always been confined to a given space; even in this day and age we are finding that in our communities where our youngsters are more limited in the amount of freedom that we may allow them in areas of play, there is a certain amount of reduction in their concept of temporal-space relationships.

We grew up in small communities where we could run around the entire town and there were not many limits. Some of us seemed to build up different kinds of space relationships; for example, as opposed to the child who was confined to just one city block. On the other hand, we build up different kinds of relationships and concepts now because of travel. When we travel, as we do now a great deal by air, the time it takes to get from Denver to Chicago is so minimal that it is very difficult for many individuals to talk about the distance in miles. Now we talk about distance in terms of hours - "How far is it from Denver to Chicago?" We will say, "Two hours," whereas formerly we might have said 1,200 miles, or two days and nights. So it is all relative. The point I am making is that it relates back to the experience the individual has had in regard to things we talk about with reference to motor development.

We will move from gross motor activities to fine motor, or adaptive, behavior that goes along with the development increase in function and maturation. You find the individual moving from the gross to the fine, or from concrete to more abstract. This is normal; it is what we would expect as the child has experienced these gross activities. He is being readied for involvement in the finer activities. We must remember that much of this will depend upon the kind of experience the child has. If he has not been exposed to manipulating small objects, playing with these objects, arranging them in certain ways, etc., we cannot expect that when he gets to school he is going to be able to manipulate, to handle, to arrange, to organize and to do the things the normal youngster is capable of doing. Again, we find great differences in youngsters coming from culturally deprived families and situations. This is not always true; we also find this being true in some of our higher socio-economic classes and you ask, "Why is this true?" Often these are things that parents may not like to have around; colors and crayons and paste with *all the mess involved. Some children actually do not have, and have not had, the varied experiences which are necessary to develop fine motor coordination.*

Oftentimes we fail to realize the importance of the developmental process, that the clutter which may go along with this activity is very important to some future event which we are attempting to teach a child. I would also go back at this point and pick up a reference which I made earlier to the culturally deprived. I do not like that term because actually he is not deprived; these people have a culture of their own - the children have experiences. The experiences however, lack the depth and breadth of the normal youngster. The standard by which we would establish what is, or is not, cultural deprivation, is the educational system. If and when we are able to work within the system that has been established and the norms that are established, then we say we have had good experiences; we are not operating with social and cultural deficits. These are certain things, whether right or wrong, that the educational system establishes. These norms establish, "This is the way it is now."

The same is true in terms of speech and language behavior. In certain parts of the United States people could care less whether or not their youngsters receive speech therapy or whether there is a program of assistance to help those youngsters with their speech problem. Their primary concern is survival; or their primary concern is that of something to wear; or that of even walking to a school. The things that are said on the part of children or the adults are of little concern as long as everybody can understand each other in one way or another. To try to talk with them about providing experiences so that we could develop better motor coordination in their children, that we might have a better perception in terms of their visual-motor activities and skills, would probably cause them to ask, "Why? We only want to eat; to be warm; to be clean. These are the things we want. The other things do not matter."

Now if we could say, "In order to get this, you need certain other things" it gets to be a little bit difficult oftentimes for them to understand. Perhaps a different program could be established on a level prior to formal education to help establish better concept formation and pre-learning skills. The point of all this is that the things we have taken so much for granted in terms of normal development and maturation (which is based upon experience exposure) are going to be extremely important as they relate to speech and language learning activities. I do not know what kind of schools you will be working in or what types of children you will see, but I venture to say you will find individuals with whom you will give some assistance, who will be lacking tremendously in some of these basic activities that normal children will have had at three, four and five years of age. You say, "Is it important that we go back and pick up some of these things?" We feel that in many cases they are important. You do not build a house by putting the roof on first. You have got to have a little foundation and something underneath that roof. It is not to say we believe you should go back and start at the very basis as some schools of thought do - that is, you start with crawling and with the very basic kinds of activities. I would say there are certain activities, however, that are extremely important. The child must have some exposure to fine, gross motor, visual motor activities before we can expect a lot of the things which you may present to him in a learning situation in formal education process to make much sense to him. We have got to have some basis on which to build some of the things we do.

Child Growth, Speech, and Language Development

Lloyd E. Augustine

When we talk about speech and language development, there are a couple of things that we have to keep in mind. That is, there are a couple of things that have to be operating before an individual organism can actually learn, and learn in a normal sort of way. This would also apply to the developmental processes, and I want to break these down into three different areas and make reference to them as physical, psychological and environmental.

In other words, in order for speech and language to develop normally we need three different things that are intact as far as the organism is concerned. When I talk about physical, here I am actually talking about the physical process which involves the Central Nervous System, and the Peripheral Nervous System. When I talk about the Central Nervous System, I am talking about normal function as far as the brain mechanism is concerned; when I talk about a Peripheral Nervous System, I am moving a little bit further down in the organism and I refer to those things which are basic to hearing, seeing, touching, etc. In reference to the psychological process, here we mean the individual must be intact as far as his emotional behavior is concerned. I would also include here those things which refer to intellect. As far as the environment is concerned, this includes the type of experiences which are going on around us all the time. Everything that goes on about you actually is included within your environment.

The way an individual will react to his environment is going to be dependent upon how intact he is in terms of the psychological and how much intactness he has in terms of hearing, seeing, etc, or how intact he may be in terms of the function of the Central Nervous System. These things work together but when we take a look at the individual and how he will develop, we need to break them down. These are variables which are existent in terms of normal development and then we could switch it around and say these are also variables which are going to interfere with normal speech and language learning.

First of all, we shall define for you the behavior of language. Language is what man does just as walking is a behavior of what man does. Language is a behavior which encompasses many things. First of all, it is something which we have learned. It is also a behavior which incorporates and uses a symbol system. Some people prefer to call this a code. I prefer to use it as symbolic or a symbol toward behavior. Symbols take on many different forms. This is the definition of language: the learned symbol system which has meaning value. It is communication in nature. When we talk about a communicative or a meaning value being associated here, there is a certain inference which exists *which means that there is more than one individual involved. In other words, when we use the word 'soap' it will also convey some meaning to you. We can narrow this down and use another symbol, saying, 'Lifebuoy soap', and a certain kind of pungent odor is conjured up. If we talk about Dial soap, again, you have the experience of smelling Dial soap as a result of all the television ads you may have seen and you know that you are going to be 'safe around the clock.'*

So it begins to take on some breadth and depth when we put a symbol up and begin to use another symbol with it. There is some meaning value that now is established with this particular sort of symbol system. It has some very specific kind of form as you see. This happens to take on a written form. We can also use an oral speaking form. We can give these symbols in a verbal manner or in a written form; also there is another symbol form, such as a gesture type of symbol. There are gestures which we may use that will convey some very specific kinds of meaning. In certain types of disorders, which we call language disorders, it is very difficult to know where we may feed in some information to a child and he appears to understand it but he has difficulty feeding it back to us, what is really going on in terms of the way he classifies that information and the way he uses that information. The thought process is a very complex situation and we will not go into all of its ramifications, but it is part of the language system.

As a part of this thought process, of the internal integrative function of language, we come up with this idea. "I can communicate with myself, can I not?" In other words, language is not only for communication with others, not just an inter-communicative process, but it can be intra-communicative. We would have to say, at least as far as we are concerned, "Yes, this is true." We do engage in a process here where we reason things out, where we are actually in one form feeding it in and out. But you see it is all right there; it is not coming in or going out. We have classified the symbols; we have a beautiful filing system. There are times when we say, "It is right there but I just cannot think of it." Maybe you have not plugged in the right channel to retrieve that bit of information, but we have classified this, and we have a certain way in which we store that information. We rearrange it. When we learned the symbol 'dog', at first all these wooly, four-legged animals that said 'bow-wow' became dogs. It could have been any furry animal, but then we began to discriminate. Some of them did not say 'bow-wow'; they said 'me-ow'; they were four-legged and they were furry, but they were something else that somebody called 'cat'.

Now we have two classification systems for four-legged, furry animals - dog and cat. Within, all of a sudden, we had big dogs and little dogs, and big dogs maybe were mommy dogs and little dogs were puppies, but that all came under the dog classification. As we became more sophisticated we then began to classify purebreds and mongrels. Then under purebreds we had Boxers, Poodles and Collies. These were classifications which you set up. Now when you want to communicate a specific idea about a dog to a member of your family you say, "You cannot believe what horrible thing happened to me today". You do not say, "I just ran over a dog." but - "I ran over this beautiful, *silver Poodle," which immediately conjures up in your mind, "Silver Poodles are expensive." So there are different things that we do in terms of our classification and the meaning that it takes on going back to the kinds of experience you may have had. But this too moves on from the concrete to the abstract. This is the way in which we function in this language learning process. You have learned very concrete sorts of things and now you refine them, and refine them to the point with your own education (I am not just talking about formal types of education, but through your learning various things). You now have also conjured up other labels which may apply to dogs. How many different words could you now recall that you could say and use for dog and yet we would all know that you still had reference to dogs?*

In Africa there are different kinds of symbols which refer to an object. The report is that the Eskimos have many terms for snow. Supposedly the countries where there are camels, people have 200 terms for a camel. As far as we are concerned, a camel is a camel; yet by the same token, in America we have Chevrolets, Oldsmobiles, Chevelles - you see, they are all cars - but these are different terms, or labels that you would use to conjure up a different degree in size. It is not just a car. A Volkswagen is not a Cadillac; they are both cars - but the label you use to select will give to it a specific sort of meaning. So, here we are dealing with labels that are very specific, very broad, very complex. But it is extremely important that we say exactly what we mean in order to cut down on the misunderstanding that exists. Now within the symbol system there are also, what we would say, non-verbal types of communicative things which exist, which are extremely important. If you shout or yell at your children in a certain way, they know just exactly what that means. There may be a degree to which they can push mother in a certain thing they want to do, and at the point where there is a certain harshness or intensity to the voice, they know they have gone just as far as they can go. That is not written into a specific label - it is something which we have added.

There are non-verbal kinds of communicative symbols which exist, actually, that are built into the language we use. This exists and becomes an extremely important thing when we take it beyond our communicative process here. In other words, if I say something emphatically and with a certain intensity it carries a certain meaning. The point I am trying to make here is that the symbol system which we have is not only written, not only oral in terms of words - but intensity and many other things may carry emphasis. These are all things that exist within the language system.

There are an infinite number of symbols that can be put together. By that same token there are certain rules which exist within our language system. In other words, we do not put certain kinds of consonants together. We do not have any words where the /t/ and the /p/ would follow each other initially in a word - although we do have, for example, the /tr/ combination. You say, "Who thinks up all those rules?" These have evolved over the years and as our English language developed there were certain things that just did not occur. When you see a clinician in the process of testing certain kinds of symbol combinations you will find that not every conceivable combination is there. Not every conceivable combination is used in our English language. When we evaluate or analyze the symbol system a particular individual may use, we select only *those things that would occur. But when we talk about infinite symbols we talk about the constant change and development of new symbols. Those of you who are older have had much more experience with this than some of you who are younger; for example, those who have been around since World War II have not been exposed to some of the terminology, or have grown up with different terminology. The past few years we came into the space age - Sputnik - whoever used the term 'sputnik' ten years ago? We talk about the Atlas program. We have known the label, Atlas, but you see it now carries with it a different connotation. We are constantly increasing the repertoire of labels. You find today that vocabularies have increased fantastically among young children. The words they are using today you might have learned, yourself, just a short time ago. This is a product of television, the kinds of reading programs our youngsters are involved in today; the exposure they have to information is fantastic. Consequently, they will increase in the number of labels they have available to them to use. You will find a first grader who will come to you and talk to you about the size of an individual - rather than being a fat person, it probably is an obese person. You say, "I never knew that word until I was such-and-such". These are the kinds of labels he now has available to him and in many instances if you ask him to list all of the words that mean 'so-and-so' you would be surprised as to the number of different labels he can use. As a result of this, children today are much more articulate than children used to be; it is a product of the time.*

There is so much emphasis today on good communication skills and that is our purpose in being here. We emphasize it a great deal because we know it is important to get along, to get ahead, for survival. We put a great deal of emphasis on the acquisition of good language skills. There is an infinite array of symbols we can use. If we were to give you some formal kind of definition of language, we would say it is a learned symbol behavior which has meaning value for other people. It is used to refer to the past, to the present, to the future; it will be carried out through a number of different media, such as speaking, writing, gesturing, and thought process. All of these things taken together make up this very complex behavior we call language.

When we talk about speech, you see it now within the context of language. In other words, it is that spoken portion of the language behavior; so when we talk about speech we talk about that oral aspect of language - that which we say. When we talk about the broad concept of language remember we take into consideration not just the spoken part, but the written. That which is written is also language and also a symbol system and it is extremely important; but as an adjunct therapist, aide, assistant - whatever you title is to be - you are primarily concerned with the spoken aspect of language. It is also important for us to know what kind of things are entailed in the developmental process of this big, broad behavior that we talk about. That is why these things have to be intact. We now come to a definition of this particular behavior that we are talking about.

Now I want to talk more specifically in regard to the various kinds of stages that the individual goes through in the developmental process. When the *infant is born he engages in a form of vocalization which we call the birth cry. Some people will question whether or not this has any significance to speech and language development. People will say, "It is a physiological sort of thing and in order to speak we have to use the lungs, we have to use the teeth, the tongue, and such things." All of a sudden the child is born; he lets out a yell which is reflexive in nature; it is a cry; he has made a noise. That noise later on is going to be used and developed into the speech form that we have made reference to. Some people say that being born is the most traumatic thing that ever happens to an individual; and the fact that the child cries demonstrates this tremendous frustration.*

The birth cry and crying behavior which takes place over the next few weeks is relatively frequent and it is interesting what happens during that time with crying behavior. The child begins to cry when he is uncomfortable (when he has discomfort it may be as a result of some internal discomfort, of being hungry, some external discomfort such as being wet; it may be that there has been too much noise around the house which is foreign - again, some uncomfortable sort of thing). What happens? Here comes mother and she assists. This takes place for a period of time and he becomes conditioned. When we use the word 'conditioned' we also mean he learns that when he makes these noises something is going to happen. Very early he has established a control over his environment which he will use for the rest of his life. In other words, the mouth, and the noise that comes from there, is used from the very beginning to exert certain kinds of influence and pressures upon the environment to cause change. It starts right then. He cries and Mother comes. But maybe he has not cried hard enough, so he cries harder and louder; and we come to a point where we say the child is beginning to demonstrate differentiation between certain cries. The mother says, "I know from his cry when he is hungry."

You ask if that has any kind of language significance. If we go back to this symbol system and it carries some meaning, it may be only a two party communication - he cries, you understand; you make the change. There is something going on between the two individuals. The symbols which he uses are pretty gross; they are loud; they also may be a little discomforting to us so in order to stop them we do whatever we have to. But during the first couple of weeks we notice that not only is the child engaging in this crying behavior but there are also other kinds of rather gross sounds that are coming into play. They do not carry any kind of meaning value whatsoever; but you will notice that there are some sounds other than just crying. You will also notice that sometime between month one and two that when you come to him, the child is demonstrating a certain response to you which he did not at first. The crying itself may have subsided somewhat but there is an outward kind of recognition in terms of a smile. Now the smile is noted and we emphasize that smile because it is the first point at which environment has some kind of meaning. He sees you and he begins to smile. Something else has probably happened at that point too. Whether you are aware of it or not, you have begun to talk to him. From the very beginning you go in and say, "Oh, what is the matter now? Are you wet? Are you hungry?" You are making all kinds of soothing, comforting kinds of responses to him speech-wise, and he is *receiving (not in a meaningful way), but here is a non-verbal symbol that is going through. There is an association which is being made at this point with the way in which you are talking to him. It is done concomittantly with a soft, soothing voice, comforting him and relieving him of a basic need which he may have. It is not the words, but more the tone; there is sound which is coming through that can be very important.*

Now by the same token, if you stormed in that room and said, "What is going on in here now?", you may relieve him of his discomfort but there may be an association with that kind of harsh, raucous sort of way and comfort. Because of the way he has been conditioned to respond to that, it is not a very pleasant sort of thing. That is not the way we operate. The point we are trying to make is that there are various kinds of non-verbal symbolic things that are being fed in from the very beginning and these are extremely important.

There used to be an idea that those things which happened in early months in infancy really were not very important. You often heard it said, "In the first year he is nothing but a vegetable anyway." "It really does not matter who takes care of him." That really is not true, and we hesitate to get into this kind of a discussion because at times there are young working mothers in the audience who begin to feel very guilty about the fact that they are not home. Certainly there are ways of taking care of the situation; but good child care in the early months is extremely important. When we say good child care, we do not mean just changing the diaper, feeding the child, and taking care of it that way. By good child care we make reference to the kinds of stimulation which are presented to the child by an adult and this is extremely important because at this early time the child begins to form various kinds of attachments to the adults within his environment which play a tremendous role in language-learning processes. We have some very interesting evidence today that is referred to as 'deprivation studies' which deal with youngsters who have been reared in an orphanage environment. Although these children have had good care in terms of their basic needs being taken care of, the mortality rate is very high among them. Those who do survive do not attain the same level of linguistic function or intellectual function as the home-reared child. It does not mean they lack the native capacity, but there are certain things within the environment that lend to growth and development, speech and language skills, intellectual, emotional, and even physical motor activities that are extremely important. The aspect here of the child being stimulated by the mother, the things she says, the way in which she cuddles him, the way in which she holds him, these are important aspects that relate again to many of these experiences.

One of the studies done by a young psychologist in three-month-old infants (orphanage type infants) was where the doctor went in to the cribs of the children; for the first couple of days she would look at the children and make no response if they made any kind of sounds. In this way she was able to get what we call some kind of baseline behavior, seeing how much noise and sound the infants made. Then following that period, every time the child would make a sound, she would smile at him and chuckle, and at the same time would touch him. Over a period of only three days the amount of vocalization that *these children made became significant over what they had done in the previous period of time where she made no response to the sounds they were making. Then she followed this by another period in which, again, she was just there and made no response to their vocalizing; their vocalization rates went down. The point she was attempting to bring out here was the fact that youngsters, even at that very young age, are very readily conditioned to the kinds of responses that we adults make in their environment.*

The early vocalizations, although they do not carry with them any specific sort of meaning, they do give the child the opportunity to experiment with the vocal mechanism. They also give him opportunity to engage in what we call vocal play activities, which we feel, have some very basic psychological importance to the youngster. Hearing himself, even that is important at an early age. How often do we just talk for the sheer pleasure of hearing ourselves talk? "It makes me feel secure; I know I am here - or I am not all by myself." Again, this has much to do with the way in which we 'keep ourselves' in some kind of intactness, as far as the personage is concerned.

We have been talking about the first stages of language development. So we talked about the crying stage, whether differentiated or not, this is at the very early stage of the child's development.

We move into a second period that we classically refer to as the 'jabbering' stage. This usually takes place during the fourth or fifth week; now that does not mean, as I pointed out, that all of a sudden you are going to see some of these behaviors. During this time this very independent crying behavior begins to become more prevalent than we have noticed before. According to most authorities, we also will find that babbling behavior is considered to be a pleasurable use of vocalization.

We also note that during this time a very unusual thing is happening. When the child is engaging in these pleasurable sorts of vocalization he is doing so in the absence of adults. You will also find, if you scrutinize the vocalizations very carefully, that it could be a foreign speaking child lying in the room. In other words the vocalizations are kind of non-English type sounds. If you ever tried to imitate them, you would find it almost impossible to do. They are kind of gutteral in nature; they are just different - but the youngster is beginning to engage in a lot of different things at this point which are satisfying to him. He is learning that if he does 'such-and-such' with his tongue, or 'so-and-so' with an air stream, this makes a sound; it may not be much of a pleasure to him in the way it sounds to him, as it may be to him in the way it feels. Now all of a sudden this is different; again, starting at a very early age he is beginning to demonstrate that by manipulating different things with an organism that he can receive certain kinds of pleasure. Just as I discussed earlier, the crying seems to be manipulating things from the outside.

As he engages in more of the vocalizations, more of this babbling, more of the fun kind of sounds that he is making, you also are becoming more and more interested. It is another one of these subleties that is being worked on by this little fellow in the crib because you will begin to use some of those little funny sounds that he uses. You have heard them; you walk into his bedroom and the tendency now may not be so much to say, "What is wrong with you today?" But to go in with /g-g-g/ - doing these kinds of things after him. You are involved in his kind of vocal play and this gets to be very much fun for both of you. You make him a funny sound; he is smiling at you. That reinforces you, so you do it to him; and the next couple of months you and he are going to be moving into another stage of echolalia or imitative kind of behavior. It is during this period of time that there is going to be a lot of exchange between the two of you in terms of the kinds of sounds that are being produced by you. As I say, these are not just English-type speaking sounds; many of them are nonsensical and we find from our research literature that all infants are engaged in the same kind of sound making at that stage - whether they are French, German or Chinese babies. They all use these types of sounds. What happens then during this period of time that makes English speaking individuals different from French speaking individuals? This is the point at which we begin to start shaping the various sounds that the infants are making. As he produces various kinds of sounds in your presence, and you begin to imitate certain sounds back, whether you realize this or not, you are limited in the repetroire of sounds that you can produce right now as an adult. This is where we fall down in learning foreign languages; not that we have so much difficulty in learning the vocabulary of a foreigh language, but speaking it. These are things that are a little bit difficult now etiologically, because we have not had the practice.

Now the child is growing into the three-to-four-month period and he is beginning to echo and imitate and you are imitating more of what he is saying, and he is getting a little more to the point where they sound like your sounds. Here he is beginning to build up some early discriminations between those things which are going on on the outside and those things which he is doing. There are processes that are taking place that are very difficult to understand physiologically and neurologically, but it is happening; plus the fact that sounds that are not right or those sounds that do not appear in your repetroire of sounds (I guess, here again, you set the standard of what is and is not acceptable - you may not get particularly excited about those sounds he may produce.) You might not hug him as much when this particular sound comes out as when another one is formed. You know that 'mama' might evoke from you certain responses that would be a little different from something else. Here we begin to associate various kinds of meanings a long time before he does. This is good because what we are beginning to do at six months of age (before that actually) is to make associations for him of the sounds he produces and objects within his environment. You are just an object but a very fine object. The things which come out such as /d-d-d/, right away we begin to make associations with /da/, /da-da/.

It is a very interesting thing the way we begin to teach certain kinds of labels. Sounds are probably the most difficult thing for him to handle of anything that exists. When there are two people in a situation, somebody has to make some noise; whether it is words or sounds, that is kind of the way it is. Here, again, it starts very early. The infant is alone in his crib and he is making some kind of vocalization; he engages in vocal play. Psychologists *say this is bringing the mother to him; in other words, bringing the environment to him. He, as a sound producing individual, knows this helps him. We fill a gap in feeding him. What are you saying? "Now take a bite." Or are you making some kind of nonsense sounds to him? Or you may draw his attention to some kind of thing which you have observed. Consequently, we begin a labeling process through various sounds associated with objects before we move into the actual word. This does not always happen, but it very frequently happens. If you can think back (some of you who have children) to some of the little, what we call 'baby talk' terms, that made reference to certain things within the environment - how did they get it? Was there a time at which certain sounds in the vocal play imitation period were associated with the object?*

One thing we say over and over again, as sophisticated speech and language clinicians, to parents is, "never talk baby talk; always speak properly". We venture to say there probably are no greater breakers of that particular rule than speech people! The point here is we begin the labeling process based on many of the nonsense sounds that the children produce at a very early age. We need to be somewhat careful that we do not carry these things a little bit too far. Certainly we can, and do, shape them into appropriate labels that have meaning. As the terms 'ma-ma', and 'da-da' come along, we are sure we have written evidence in baby books that many children have been reported to said 'mama' at six months of age. Here again, this is the term that you have heard and this is the meaning you have given to it. We doubt, although we can never deny, you were the person who was there, you were the one who observed the behavior: but we would doubt that that really took place at that particular time. We do not doubt the child made those sounds but we do doubt that he had particular reference to you. The point is we begin the labeling process and the child now begins to associate certain meaning with this; and in the imitative process that we go through, we build up this repertoire of sounds which develops into symbols so that by the time the child is somewhere between ten months of age up to 18 months, he is going through a very, very fast period of true word acquisition.

Prior to that time, however, we have built up a fantastic repertoire of concepts; a fantastic repertoire of words is internalized: they are being integrated, they are being stored, they are being cataloged. They are not yet being used in an expressive nature so that we could say, 'that label means that'. But at the same time we find that long before he has been able to use those specific labels in expressive form, he has demonstrated of us that he understands many labels and words. When we are saying to him as he is crawling and he has been able to open what we thought was an unlatchable kitchen cupboard latch, reached in and pulled out a number of things, you attempt to teach that "no, no" has some significant meaning. Or you say to him, "Go to your daddy." He crawls to his daddy. "Go to sister." He crawls to his sister. "Go over to the highchair, we are going to eat." He crawls over to the highchair. Whether he has understood the whole complex sentence or whether he has associated the meaning to 'eat' with the highchair, really does not matter. At this point we have established some kind of communicative process with the child and he is responding to labels and words which we have *given. We would say that his receptive language skills are good. Here we throw in another term, receptive language skills. Those responses which the individual youngster or person is making to this auditory stimulus comes before his expressive language skills; but this is important for a couple of reasons.*

There will be children whom you will see in the public schools who seem to respond very well in this area of receptive language skills. In other words, they understand what you say to them and are able to carry out various tasks which you give to them, but when it comes to his ability to express the act which he was able to carry out, he cannot say it. So there will be differences but we must also keep in mind this goes back to the developmental process. First he was able to handle those receptive language tools and skills before he could handle the expressive. If we again go back from concrete to abstract, we see this is on a little different hierarchy than the expressive. It is a little bit more abstract to be able to express ideas than it is to understand them.

When we get into the true word acquisition stage, the child begins to use what I call a portion of a word to mean an entire idea or concept. In other words, it is like a whole phrase in a portion of a word. When we put the child to bed at night and his 'teddy' is not there because we washed it (and it is downstairs drying) but he keeps saying 'te-te', we know immediately what he means. It is his way of expressing both a sentence and a concept. Or 'wa' may mean, "I spilled the water on the floor", or "I need a drink." A lot of this is taken into the context of where this specific symbol may be used, but here again, a great deal of meaning is supplied by us. We carry out the act; this, again, allows him to learn all of these things take place upon giving this particular symbol.

This leads us right into putting our symbols together and building sentences. Sentences at first are very, very simple. We learn our nouns first; then we go to our verbs. We have verb-nouns, and we have such things as "Go bye-bye" which are learned very early. Or, "Daddy bye-bye." These take on a great deal more meaning when the child says, "Daddy bye-bye", and mother says, "Yes, daddy went to work." Now we also begin to build in various intonation and inflection patterns. "Daddy home?" A question. "No, daddy is not home; daddy is coming home pretty soon." Here are the various components that are beginning to be built into the entire language sculpturing system.

It is not unlikely that we may see a youngster in the first grade who is still using two word, verb-noun combinations, or some noun-adjective combinations. We think by that time he should have a much different sentence structure. Yes, he should. Why does he not? There may be many reasons why he does not, and you will have this discussed in detail later on in this program.

Along with the learning and the acquisition of sentences, the youngster begins to employ certain kinds of rules. There is a technical term in the field of linguistics called syntax, which refers to the order in which words appear. There are certain rules which we have within our language system that we do not consciously learn; that the article comes first, and then the noun, the verb - but as we develop (and this is one of the most phenominal things about the acquisition of language) we acquire these rules along with everything else. When the youngster says, "The boy ran", rather than, "The boy run" we wonder how he knew whether to use the present tense or the past tense. Do you make a special conscious effort of that? Why do you say "Boy ran", "Boy run"? Chances are, when he was learning he said "run" first; and then boy. "Run - boy" and you said, "The boy is running." You did not intentionally say that, but you used the correct form which was a model. This assists in building this particular linguistic structure, the correct syntax.

As the child's vocabulary increases, so will his sentences increase, not only in terms of complexity, but also in length. We note this over a period of time so that by first grade you will see a great deal of variance, perhaps, in the number of words that may be used to express a specific idea among children. This will depend somewhat on the experiences which he may have had, such as pre-school, kindergarten, the kind of home environment, the kind of interaction that this family may have had with other families, the children he plays with, and whether he is a boy or girl. We will notice more sophisticated linguistic skills among girls at an earlier age than we will among boys. This is not always true, but we find it primarily so. Unfortunately, boys have a rough time from the very beginning - all the way; even the rate of mortality is higher among infant males, the rate of various organic and functional pathologies are higher among boys, and the development will be somewhat different. This is not only true of some of the language conceptual skills, but is also true of the specific sounds that are used in particular labels.

Language and speech do change. They reflect the culture and the society, and this is something of which we must be cognizant. Sub-cultures within cultures certainly reflect this. We could go into more discussion of the kind of developmental problems that we might see within various kinds of sub-cultures, but for the most part we will not be involved with these sub-culture groups. We find there is some different normative information. A project is currently under way at the University of Wisconsin and we hope within another year or so we can have some information which will be called normative informative on the acquisition of language and speech skills of children who are in poverty groups. What we are talking about is that it is a little unfair to judge every sub-culture to these norms. In other words, we look at the deaf child as a sub-culture in terms of language and speech. What is normal speech and language sound acquisition of the deaf? Is it fair for me to always compare the child who has not had the opportunity of having information fed in the normal way, to the child who has always had good hearing? Is it fair for us to compare the environmentally different with the youngster who has had this intact? There are certain things to keep in mind that are different for these youngsters in the acquisition of speech and language.

The Speech Mechanism

Lloyd E. Augustine

I have been given the assignment to talk about the speech mechanism. Generally speaking, the speech mechanism can be broken down into three major parts: (1) a power supply composed of the lungs and associated skeletal and muscular elements; (2) a vibrating element which, in man, would be the vocal folds found within the larynx; and (3) a system of valves and a filtering device which, in man, would consist of the tongue, lips, teeth, soft palate, hard palate, pharyngeal cavity, oral cavity and nasal cavity. (see figure 1 at end of speech)

In looking at figure 1, it can be seen that power in the form of air from the lungs sets the vocal folds into vibration. The complex sounds, produced by the vibrating vocal folds, course through a system of valves and filters, where they are modified to finally emerge from the mouth and nose as speech sounds.

Our major interest will not be on the breathing mechanism or vibrating elements, but will focus on those structrues that lie between the vocal folds and the mouth opening. The area we will be discussing is termed the vocal tract.

The vocal tract is composed of three major areas: pharyngeal area, nasal area, and oral area. The vocal tract contributes to the production of speech sounds in two ways. First, it acts as a generator of speech sounds, and second, it acts as a modifier of the tones produced in the larynx by the vibrating vocal folds. In regard to the second function of the vocal tract, the tone produced by the vibrating vocal folds, when modified, can be classified in two major ways. If the laryngeal tone as it emerges, meets little or no obstruction in the vocal tract it is classified as a vowel. If, however, the tone is completely or partially obstructed by the tongue, lips, teeth, etc., it is classified as a consonant. When several laryngeal tones are modified into consonants and/or vowels by the function of the tongue, teeth, lips, etc., and are connected so the sounds produced are meaningful to the listener, the process is called articulation.

The structures involved in generating and/or modifying the laryngeal tones are called the articulators. The articulators consist primarily of the jaws, teeth, lips, tongue, hard palate, and soft palate.

The speech correctionist is very interested in the articulators because if the structures deviate too far from normal in such things as size, shape, and mobility their function may be impaired. This in turn possibly could result in incorrect modification of the laryngeal tone. When incorrect modification of the laryngeal tone occurs, the individual is said to have an articulation disorder.

Let us now look at the articulators individually. As is the case with both the breathing and laryngeal mechanisms, the vocal tract or articulatory mechan-

ism consists of a supportive framework and a muscular system. The supportive framework for the articulators consists primarily of the facial skeleton and the lower jaw, called the mandible (figure 2).

The mandible becomes a single bone after the first year of life. It is a very large bone and extremely strong. Its major contribution to speech production is that it houses the lower teeth and much of the tongue musculature. Movement of the mandible and its contained tongue results in modification of the size and acoustic characteristics of the oral cavity.

The next bones to consider are the maxillae or paired bones forming the upper jaw (figure 3). Except for the mandible, the maxillae are the largest bones in the face. They are important as far as speech production is concerned in that they form the entire upper jaw. The maxillae contribute in forming the roof of the mouth, the floor of the nasal cavity, and the walls of the nasal cavity.

Now let us look at figure 4 which shows a drawing of the oral cavity. It is bounded in the front (anteriorly) and the sides (laterally) by the teeth and the alveolar processes; at the top, or superiorly, by the hard and soft palates; in the back, or posteriorly, by the fauces. The fauces is the opening with which the mouth communicates with the throat or pharyngeal area, and the nose or nasal area.

The oral cavity is very important in the production of speech sounds since it is here that major modification of the laryngeal tone takes place. The mouth or oral cavity is the most movable and adjustable of the cavities of the vocal tract.

We can now look at the various structures of the vocal tract as they relate directly to the articulators and what the speech correctionist might consider important in regard to their functioning.

First he examines the lips. How mobile are they? Can the child pucker, open and close, widen, etc., his lips? How do they appear during rest position? The lips help in articulation, but much modification of the lips can take place without great harm to good speech production. The speech correctionist is also interested in the cosmetic appearance of the lips since children may have lips with scar tissue due to cleft lip repair and they may be very self-conscious of their facial appearance. This self-consciousness, if severe, may interfere with ability to communicate - not because of poor structural functioning of the lips per se, but because of psychological problems related to their appearance.

The next structures to examine are the teeth. Examination of the teeth should take into consideration their alignment; their occlusion or how they look when the child closes his mouth; their general condition and if any of the teeth are missing. The teeth, however, like the lips, are not in and of themselves capable of producing an articulation disorder, but may, if they deviate too far from normal, contribute to such a disorder.

In examination of the hard palate or roof of the mouth the speech correctionist looks for the following: How high and/or wide is the hard palate; how long is it; is there a hole in the roof of the mouth. Also in relationship to the examination of the hard palate one needs to look at the soft palate. The soft palate is a very important structure in regard to speech production. The soft palate is the soft part of the roof of the mouth. If you look in the mirror and open your mouth very wide and say "ahhhh" several times, you will see the back part of the roof of the mouth moving up and down. This is the soft palate. This structure is important in speech production in that it lets some speech sounds escape through the nose and prevents the escape of others. In examining this structure it is important to watch carefully how it moves. Does it move at all? If it does move, does it move symetrically or does one side go up and the other lag behind.? Does it seem long enough to close completely.? If the person you are examining sounds like he is talking through his nose you will need to look very closely at the soft palate. In examining the soft palate, it is also very important to look at the tonsils. The tonsils are located in the back of the mouth laterally to the soft palate. They cannot, in and of themselves, produce a speech disorder, but many times, because of their size, they can interfere with the over-all function of the articulators.

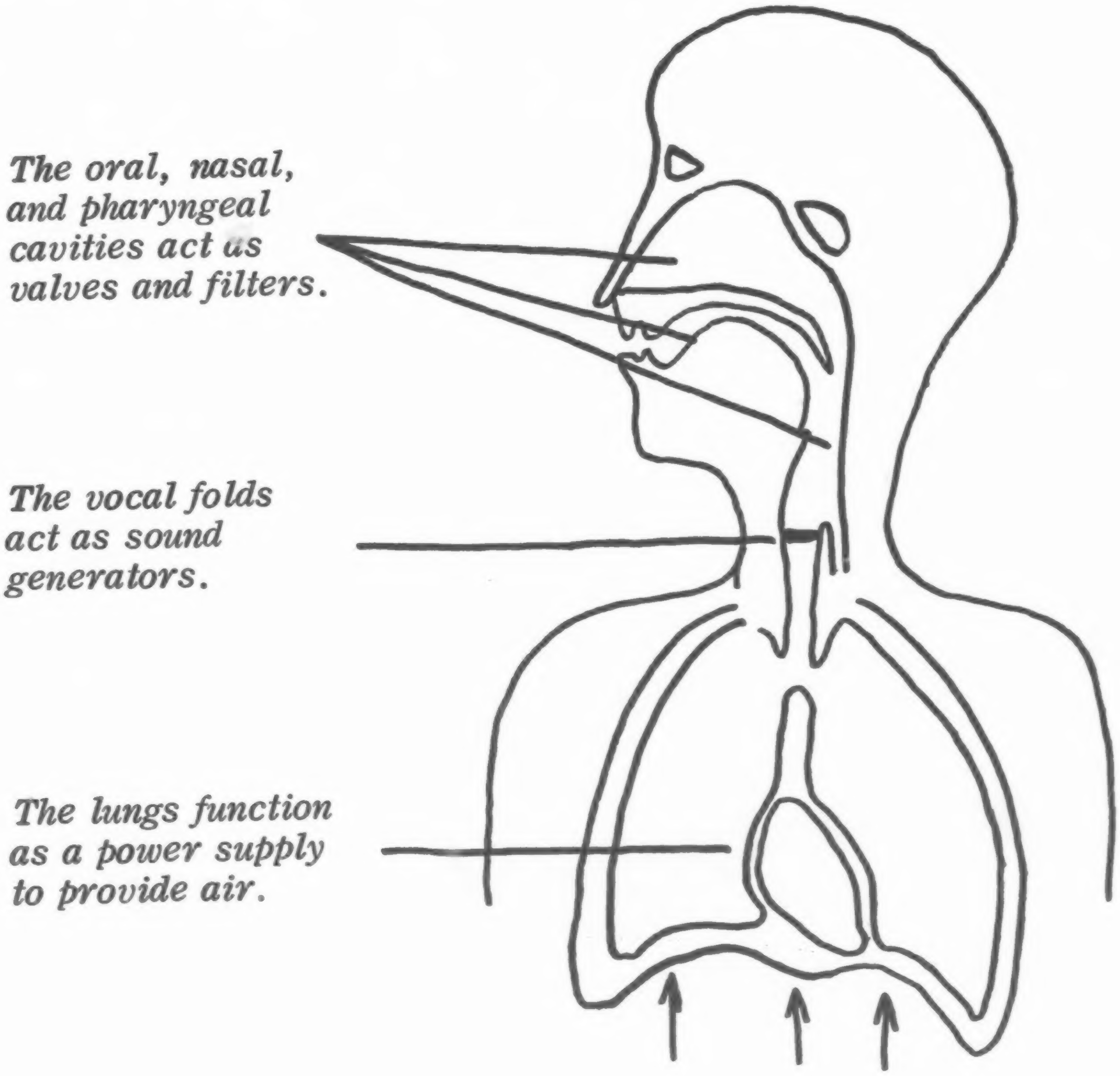
The next structure to examine is the tongue. This structure is very important in the modification of the laryngeal tone produced by the vibrating vocal folds. It participates in the production of speech sounds by channeling, impeding, and obstructing the breath stream as it passes through the mouth. It also assists in modifying the resonance cavities used in speech. The tongue strength and mobility may be restricted due to poor muscular development, disease, or accidents. What does the speech correctionist look for in examining the tongue? He looks to see how mobile it is; can the individual move the tongue at will; can he place it at various points without and within the mouth; how rapidly can he move it up and down and from side to side; when it is protruded does it deviate to one side or the other? The speech correctionist examines the mobility of the tongue in the production of various speech sounds such as /ta/, /ta/, /da/, /da/, etc.

The size of the tongue is also very important to consider. If it is too large for the mouth it may cause interference with articulation. As with all the other structures we have discussed, the tongue per se will not usually cause an articulation disorder.

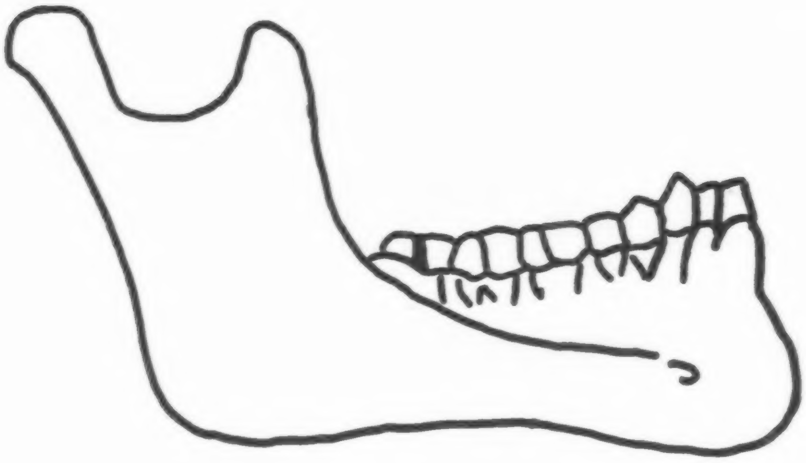
The important thing to remember in regard to the speech mechanism and its examination is that none of the various structrues we have been discussing work independently from the other during speech. They must work in a well-coordinated manner for intelligible articulation to occur. Therefore, these structures in and of themselves will rarely, if ever, produce a speech disorder. It is when all the deviations found during a speech mechanism examination are added together that we might possibly account for the articulation disorder. It is important then to note that one cannot say or can rarely say that the articulation disorder is caused by the teeth, lips, hard palate, etc.

Another point I want to stress in regard to the examination of the speech mechanism is that the speech correctionist's examination of the speech mechanism is purely subjective in nature. There are no norms as yet on tongue size, lip mobility, height of palate arch, etc. Therefore, one can only grossly estimate whether these structures deviate too far from normal as to interfere with good communication.

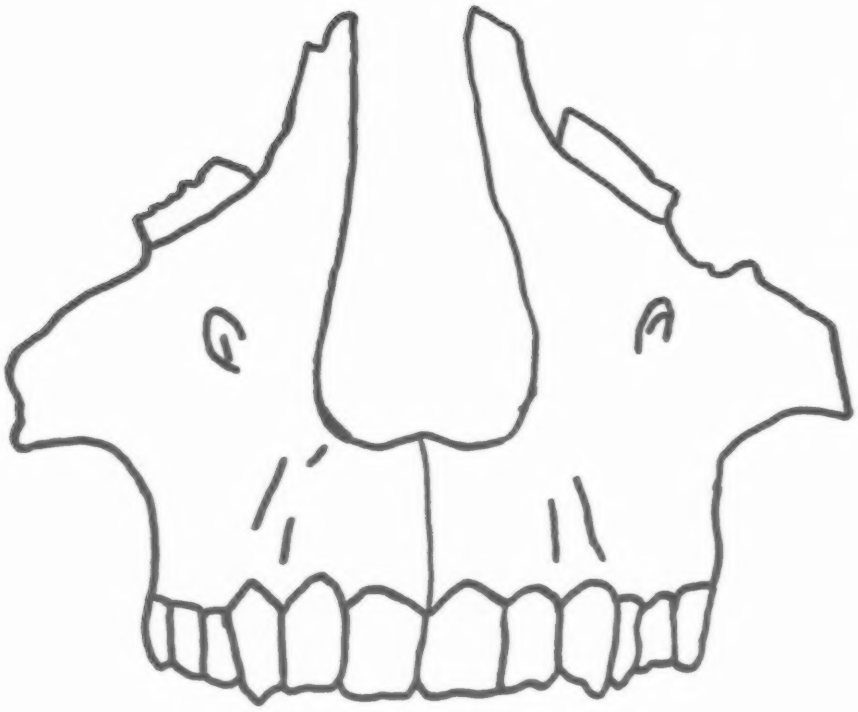
Included in the syllabus are several charts. One gives the names of the teeth and their location within the upper and lower jaws. The other gives the age in months of eruption of the baby teeth and permanent teeth. The last page of the syllabus is an examination form used in examining the speech mechanism. Also included are several books that have information on the speech mechanism.


The oral, nasal, and pharyngeal cavities act as valves and filters.
The vocal folds act as sound generators.
The lungs function as a power supply to provide air.

Schematic of the Speech Mechanism
Figure 1



MANDIBLE
Figure 2



MAXILLAE
Figure 3

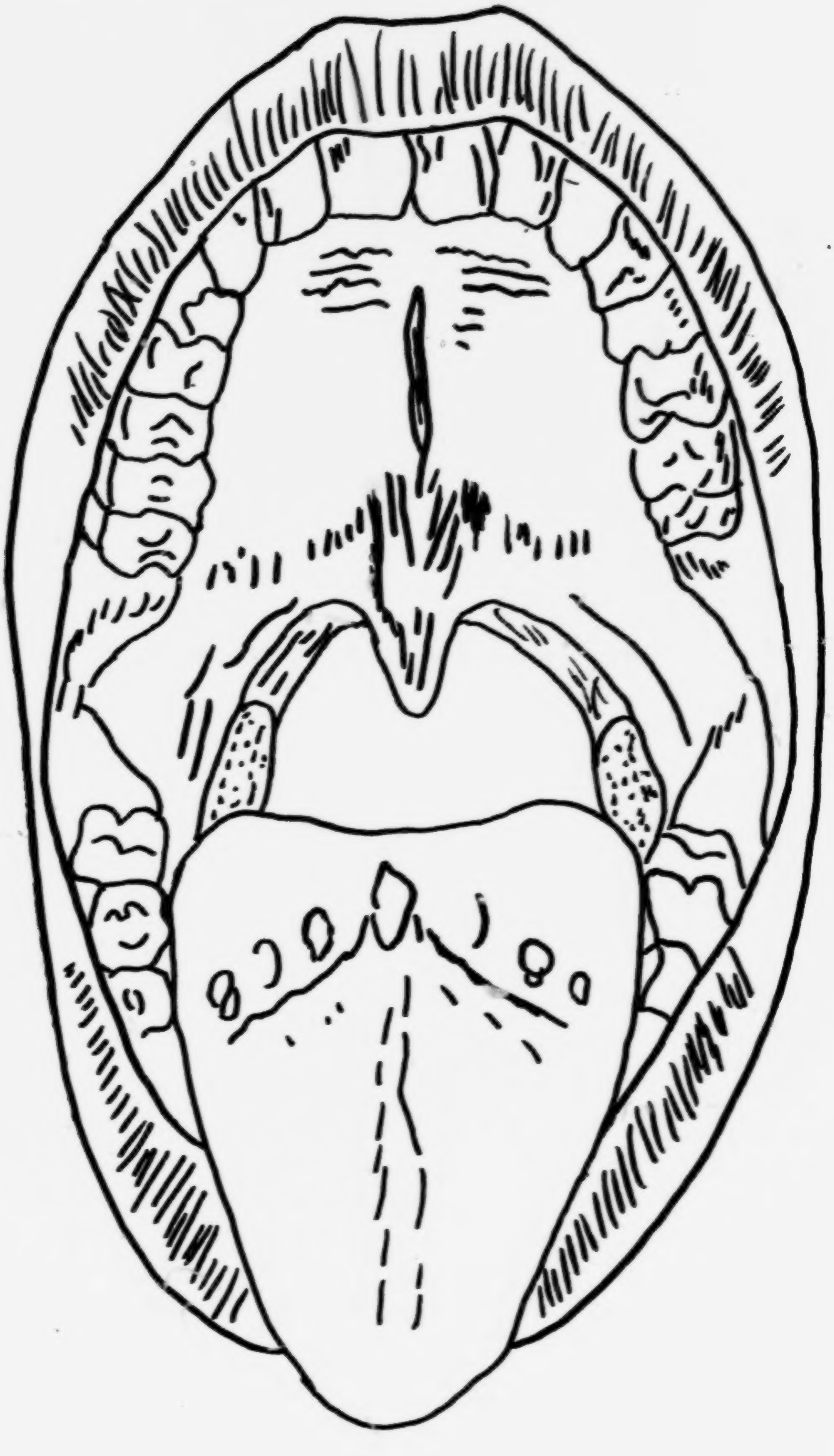
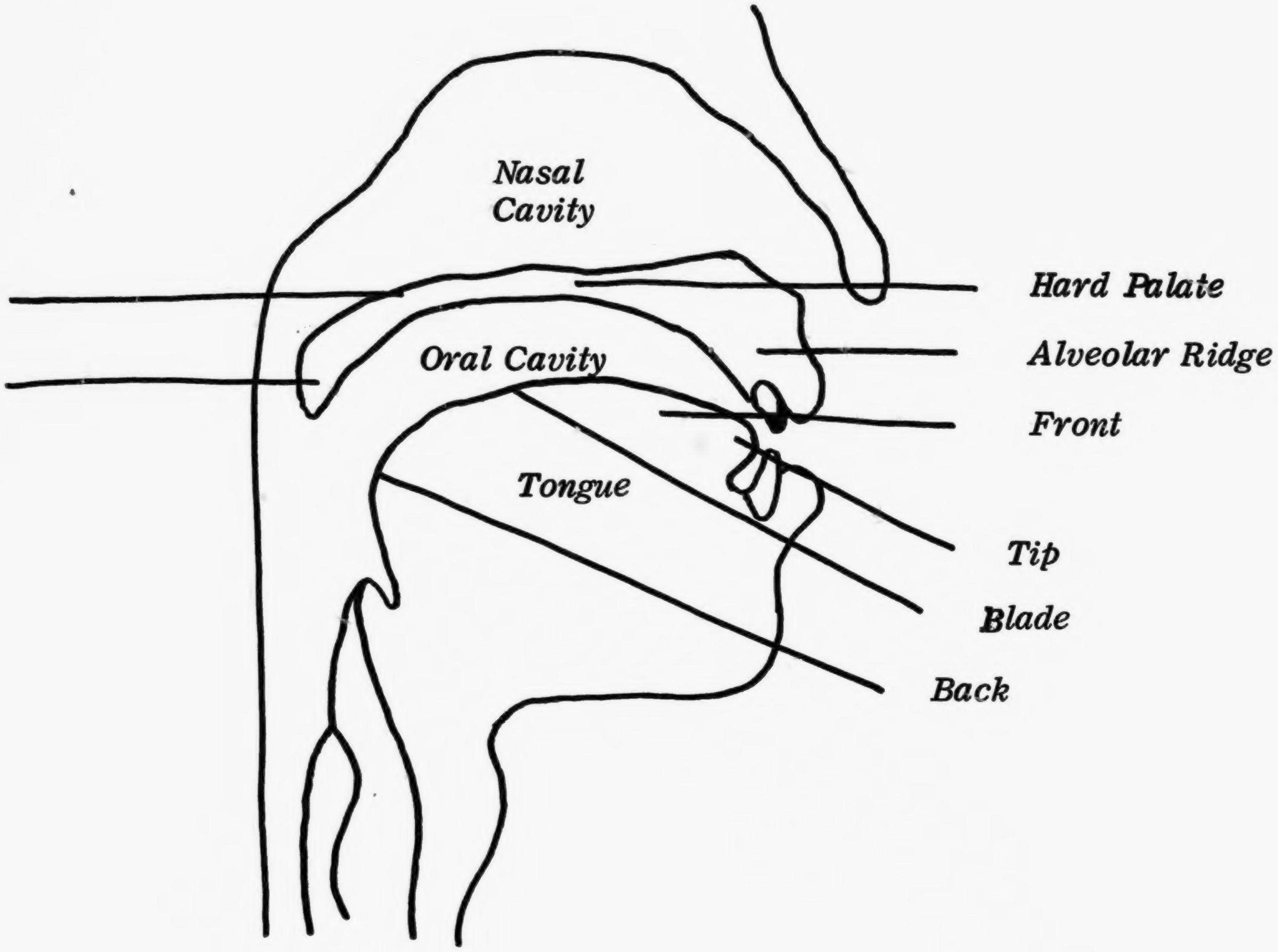
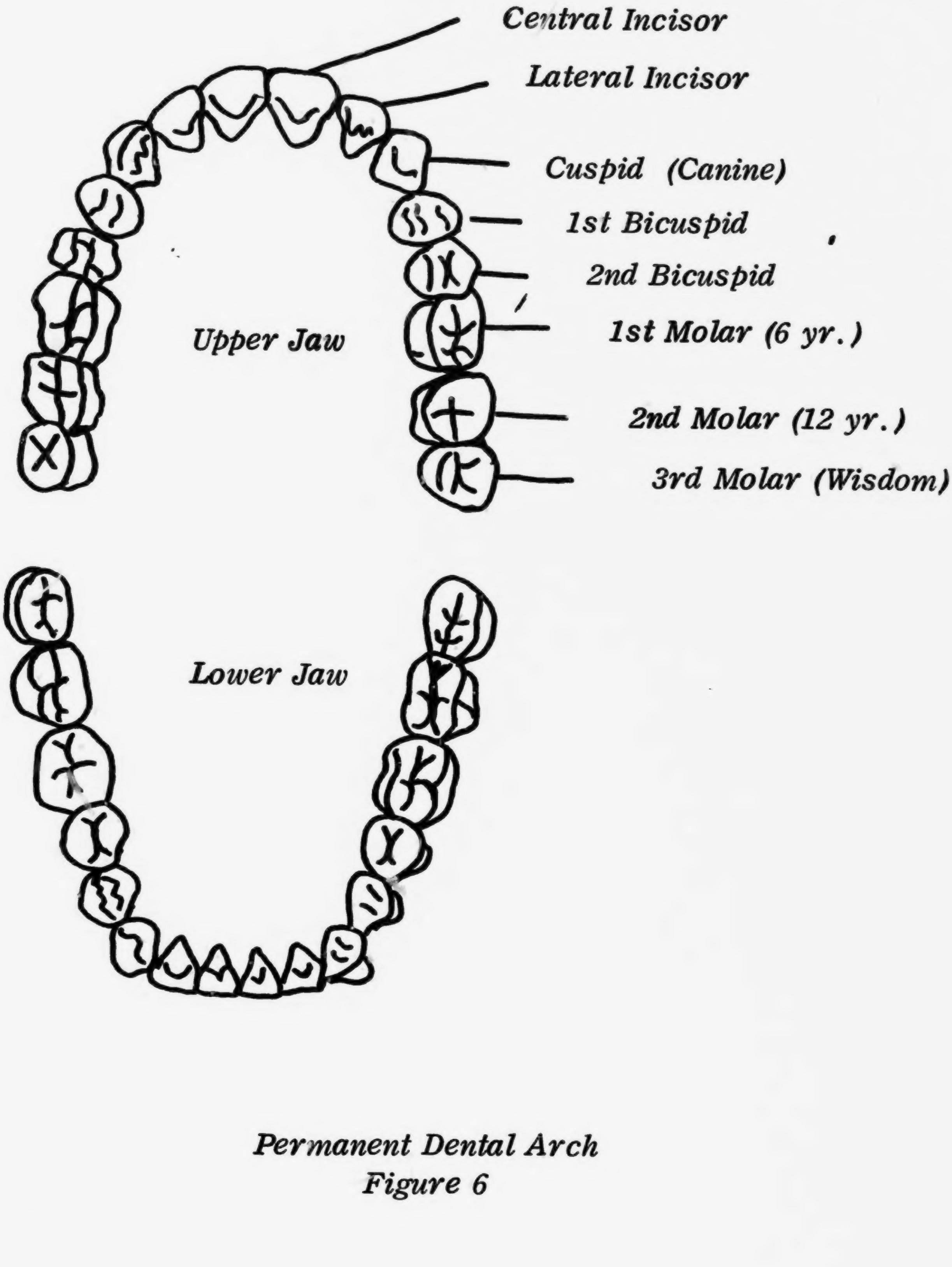


Figure 4 *Oral Cavity*


Nasal Cavity
Hard Palate
Oral Cavity
Alveolar Ridge
Front
Tongue
Tip
Blade
Back

Divisions of the Dorsum of the Tongue
Figure 5


Central Incisor
Lateral Incisor
Cuspid (Canine)
1st Bicuspid
2nd Bicuspid
1st Molar (6 yr.)
2nd Molar (12 yr.)
3rd Molar (Wisdom)
Upper Jaw
Lower Jaw

Permanent Dental Arch
Figure 6

Table 20. *Ages in Months of Eruption of Deciduous Teeth of 1962 Normal Boys and Girls*

Tooth	Earliest Age Erupted	Median Age Erupted	Latest Age Not Yet Erupted
Mandibular central incisor	4	7.8	17
Maxillary central incisor	5	9.6	15
Maxillary lateral incisor	6	11.5	21
Mandibular lateral incisor	6	12.4	27
Maxillary first molar	8	15.1	28
Mandibular first molar	8	15.7	27
Mandibular cuspid tooth	8	18.2	29
Maxillary cuspid tooth	8	18.3	29
Mandibular second molar	8	26.0	34
Maxillary second molar	8	26.2	34

Source: Sandler,

Table 21. *Mean Ages of Eruption of Permanent Teeth of White Children Living in the Northern Temperate Zone (N = more than 93,000)*

	Tooth		Mean Age of Emergence		
Order of Emergence	Maxilla	Mandible	Boys yrs.	Girls yrs.	Sex Difference mos.
1		Molar 1	6.21	5.94	3.5
2	Molar 1		6.40	6.22	2.0
3		Incisor 1	6.54	6.26	3.5
4	Incisor 1		7.47	7.20	3.5
5		Incisor 2	7.70	7.34	4.5
6	Incisor 2		8.67	8.20	5.5
7 (Boys) 8 (Girls)	Premolar 1		10.40	10.03	4.5
8 (Boys) 7 (Girls)		Cuspid	10.79	9.86	11.1
9		Premolar 1	10.82	10.18	7.7
10	Premolar 2		11.18	10.88	3.6
11		Premolar 2	11.47	10.89	7.0
12	Cuspid		11.69	10.98	3.5
13		Molar 2	12.12	11.66	5.5
14	Molar 2		12.68	12.27	4.9

Source: Compiled from 24 published reports, after Hurme,

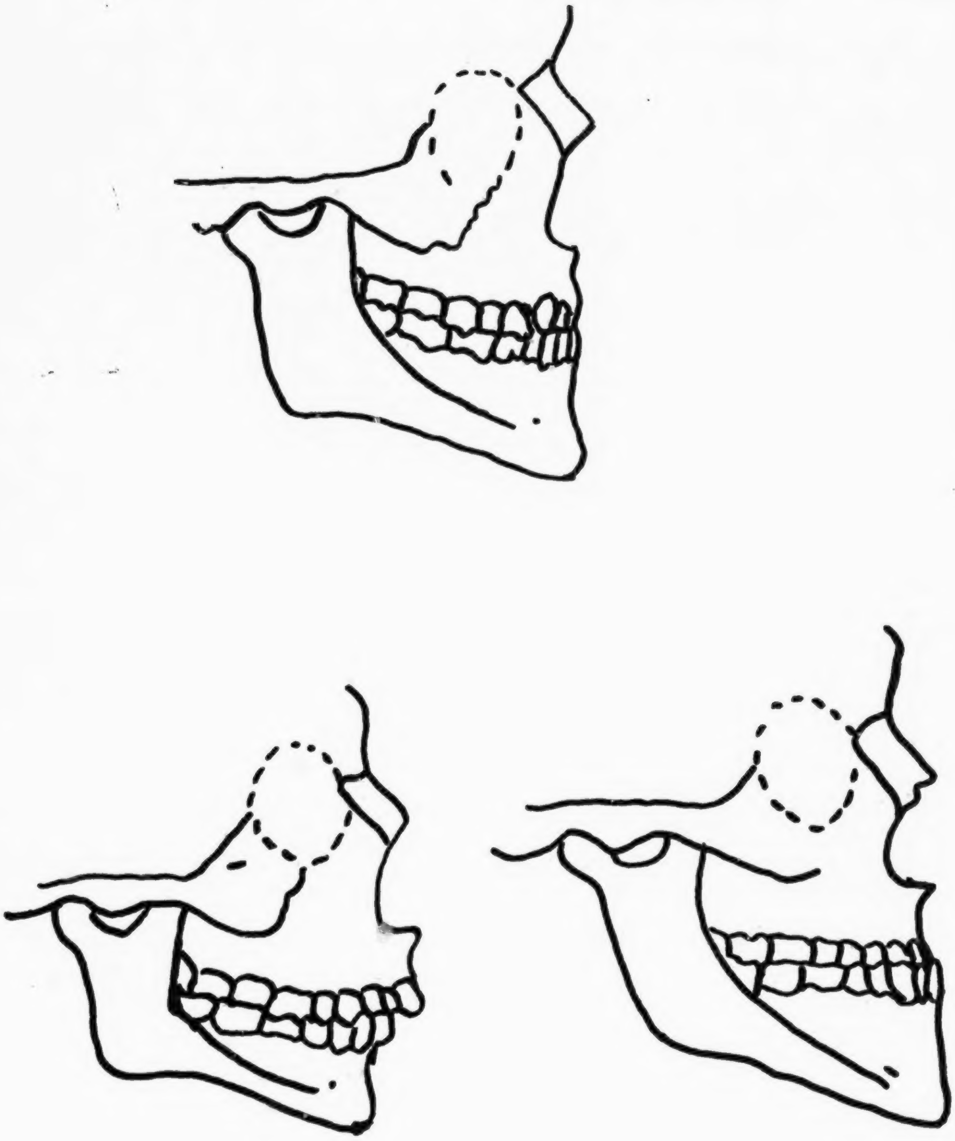


Figure 7

AUDIOLOGY AND SPEECH PATHOLOGY DEPARTMENT
Children's Hospital
- Oral Peripheral Examination -

Name ______________________ Age ______ Date of Birth __________ Sex ______

Examiner ______________________ Evaluation Date ______________

Lips: Contact during rest position __________ Scar tissue __________ Hypertension __________
Adequacy of labial tissue __________ Sluggish __________
*Ability to: widen __________ pucker __________ "open and close" __________
Drooling __________
Check rhythm and number of times subject can say "pʌ" in 5 seconds: _____

Teeth: Normal occlusion __________ malocclusion __________
Condition of teeth ______________________ Missing teeth __________
Other ______________________

Tongue: Size: normal for oral cavity __________ microglossia (length/width) _______
macroglossia (length/width) ______ frenum ______ tensions __________
tremors __________ paralysis __________
Ability to: point ________ protrude __________ lateral movt. __________
tip behind upper teeth __________ tip behind lower teeth __________
tip to palate center __________ tip toward soft palate __________
separates tongue and jaw movements: Yes __________ No __________
Check rhythm and number of times subject can say "tʌ" in 5 seconds: ____

Palates & Pharynx: Hard: palatal arch height (normal-high-low; high & narrow) other __________
Soft: normal length ________ other __________ velum & uvula (sketch)
paralysis __________ gage reflex __________ swallowing ________
tonsils __________
Ability to: blow ________ drink through a straw ________
produce a strong "k" __________ "ɡ" __________
Check rhythm and number of times subject can say "kʌ" in 5 seconds: ___

Jaws: Maxilla: normal size for skull __________ other __________
Mandible: normal size __________ other __________
Ability to: open wide __________ circular chewing motion __________
imitate jaw movements __________
Number of times subject can open and close in one second: __________

Nose: Sinus trouble (describe) ______________________
With lips closed, can subject breathe normally through nose? __________

Breathing: Type: (Abdominal, medical, thoracic, clavicular) __________
Control of breathing movements: (smooth, jerky) __________
Ability to: sustain steady exhalation (10 seconds) __________
sustain steady phonation (10 seconds) __________

Summary of Observations:

*Note: Use comparative terms when possible. e.g., poor, fair, good, excellent.

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Disorders of Speech and Language

Rita Weiss, Ph.D.

I teach a course at the university called Speech Correction for the Classroom Teacher as part of the block program in elementary education. I always ask the students to introduce themselves. I ask them a lot more questions than I ask you. I ask if they have had phonetics, and so on, but I am most interested in what experience they have had. I am pleased to report to you people that the trend is toward more experience. Seven years ago when I first taught this course, I would have students who had never been exposed to children. Here they were training to be teachers and yet knew nothing about children. Today, with the Clearing House program that we have on the campus at Boulder, these students have been exposed to children and this will make them better teachers; just as your experience with children will make you better aides.

This gives you a feeling for what children can do. How can you know what they cannot do if you do not know what they can do? Speech defects are in the area of what they cannot do. Have you had cleared-up for you the difference in terms? Have you talked about pathology? The name seems to be going through a transitional period; it is not what we are called; it is what we do. This is the way I was trained. When I first came into the field, I was a speech therapist; now if I were in the schools, I would be a speech correctionist; that is the term for you people, I think.

I thought I would tie in what I feel you have been told about anatomy and build from that into talking about speech disorders. It is rather a neat package, I think; I hope it is for you. There are four processes of speech and I will very quickly and schematically tell you again about the processes and then show you that a speech disorder is a breakdown in one of these processes. Because people have a breakdown for a variety of reasons, we have speech problems. The first process which is respiration is the motor. Exhalation is what we talk on. And you learned the diaphragm and the lungs, all of these organs that we use for speech, are there for other reasons. We find that we have no speech organs; all of the mechanism that we use for speech have other basic biological functions. For example, you use your lungs, your diaphragm for this power - but they are there for breathing, are they not? And these activities take precedence over speaking. If I tried to lift a heavy table and talk at the same time, I could not do it. I would have to stop talking because I would have to direct all of my physical activities to this function of lifting; and the speech would go by the board. So, speech is, we say, an overlaid process. The organs of tongue and lips are there for mastication. We eat to live. The larynx is there to keep foreign objects out of the lungs; yet these are the organs that are used for speech. All of us speak because of the way we hear. We do not have different mechanisms; the Chinese have no different mechanisms from ours, do they?

We have the respired air that we are breathing coming from our diaphragm and let us just pretend that it is coming up through a hole. We are not talking yet - but there are some children who talk on inhalation, like cerebral palsy children who have a mix-up in their musculature coordination; instead of speaking on exhalation as I am doing, they are all out of gear. The first process that could break down is the respiration process. The air is coming up and we still are not talking. Involved are the vocal folds; a much better word than vocal cord because cords make you think that they are plucked like violin strings or guitar strings - and they are not strings - they are, in actuality, one set of muscles. Never let medical terms scare you; all you have to know is that muscles take their names from the cartilages they connect. The thyroid cartilage is also right there, as are the arytenoid cartilages. Cartilages are not as firm as bones. Muscles connect the arytenoid cartilages, the inside of the thyroid cartilages.

Now this is the phonating process which I am talking about, with air puffing up and coming through the vocal folds which are really a set of muscles - one set of the thyroid arytenoid muscles. Things can happen; the process can break down. There could be growths on the muscles - polyps we call them, and other kinds of growths can form. The vocal folds, then, are not as free to vibrate. Right now, with me, they are vibrating. Bing Crosby has growths on his vocal folds and they are insured for a million dollars by Lloyd's of London because they give that particular quality to his singing voice. But sometimes these growths inhibit the vibration so you cannot speak as well. Sometimes you get irritations and, of course the most traumatic one is when you have to have the removal of the whole structure and you are then a laryngectomee - or a laryngectomized individual. The major cause for this is cancer. After the cancer in this region has been removed the person has no way of phonating with the larynx and he must be taught another way, usually from the esophagus - or esophageal speech. You will not have such a person in the schools. Two kinds of growths are polyps and nodules.

Things could happen in this region, then, which phonate and you would have a voice problem if you had polyps or nodules. I am still not talking - I am respiring and phonating, but I am not talking. We have to get some sound, don't we? We need to articulate. You are going to be in the schools and you ought not to get confused with the kind of articulation they talk about in the schools. They use the word articulation in the public schools (educators do) to talk about a program, say in language arts; how it is coordinated from elementary to junior high to high school. They talk about the articulation of that program within the school system from the lower grades through secondary. In speech pathology we talk about articulation as what goes on in speaking. It is what you do with your lips, your velum or the soft palate. This process is the articulation process, and you can have a breakdown in this process. You could have the child who has no front teeth and he cannot say /s/ because in order to say /s/s/s/ you have to keep the tongue in and the thing you use to keep the tongue in are the teeth. So there is a breakdown when the tongue comes out.

You can have a cleft palate child who has a hiatus, a real hole going through the velum. And the velum is important for making that nasal closure because there are only three sounds in English that are supposed to come out the nose, /m/, /n/, and /ŋ/, and the thing that keeps the other sounds from coming out the nose is the velum. It flips back and closes off the passage. What if you do not have a properly functioning velum? You cannot make the closure. You have heard cleft palate individuals speak - it is a sort of honking because they cannot control sounds from coming out the nose, so there is a breakdown.

Articulation is the disorder you will find most prevalent in the public schools. This is what you will be seeing your correctionists working with. Overwhelming numbers, depending on which authorities you read, 80%, 90% of the public school work is with the child who says 'fun' for 'sun' or 'wabbit' for 'rabbit'. He is having trouble articulating.

We are still not talking completely. There is one more process that is important and this is what gives individuality to speech; it is what differentiates you from me, a cello from a violin: resonation - speech quality - personality. Remember when you were small and filled glasses with different heights of water and hit them to get the sound? You were playing around with resonance. The size and shape of the resonating cavity - you have three: your mouth, your nose, and your throat. The mouth is the most important. "How now brown cow" - as our theatre people say. They are opening their oral cavity and they are projecting the sounds of their vowels because vowels are important for resonance, for carrying power. "Ah-----" could fill a whole auditorium. The consonants are not really that important for carrying power, but the vowels are. You can have a breakdown there.

A speech problem is one that interferes with communication and calls attention to itself. Now we come to speech disorders, which are what we are supposed to be talking about. It is a problem if it causes some difference or difficulty in the child himself, and/or his environment. Sometimes it is the parents who are upset and cannot understand the child and say, "please help him. We are having trouble understanding him." We always ask in the clinic, "Do other people understand him?" We have to weigh and decide. Yes, this child of four whose parents are not understanding him, who is having trouble being understood by other children, is having a speech problem. This one - give him another year - try to understand what he is saying. He is not bothered by it and he is getting along with the other children. They are not teasing him; let us give him some time. You have learned that speech development is an individual thing. What is the range? It is huge - I like to say anywhere from 8 months to 18 months for the first word. So when is a problem a problem? This is what your correctionist has to decide and this is an area you may or may not be helping the correctionist with. It depends on what she decides to do whether you will be listening to children to say, "yes, this one needs speech help - no, this one does not."

We have, then, these processes, and we have breakdowns; things go wrong for a variety of reasons - all the way from physical reasons such as the cleft palate to what we like to call functional reasons. This could be poor learning; the mother, as you said, may be talking this way and the child picks it up. There is not anything physically wrong with the child. He has his tongue, his teeth, his vocal folds, his lungs - but this is what he has heard, so he talks this way. All of these can be speech problems.

Let us go back and talk in more detail about some of these breakdowns. The first one is connected with what you talked about yesterday; the development of speech. This is the child with what we call delayed speech or language; and this can range anywhere from the child who does not talk at all to one who jabbers. Delayed speech children run this difference; we have some that are chattering all the time, but we cannot understand them; and then some that are just not talking at all. In some of your schools you may have some of these children who are not talking at all. They could be not talking because they come from bi-lingual families. Spanish speaking - this is the major bi-lingual area in Colorado. And because school is different, frightening, a lot of children, a lot of new things, perhaps some of them feel inferior; who knows what the myriad reasons are for a bi-lingual child coming and not talking. I remember one I had in Lafayette (which is a town east of Boulder with quite a large Spanish speaking population). At that time we did not have kindergartens, but the children started right in first grade (which meant they were six years old) with reading. I remember the first grade teacher just lunged at me saying, "Mrs. Weiss, you have got to take this child. He is not talking at all. In three weeks at the school he has not opened his mouth. Day after day he sits there crying." Meanwhile, the teacher was supposed to be teaching reading in first grade. So I took him into the clinic room. I had my little bag of toys which I carried with me, but I did not push him to talk. (I had a hunch he could talk; he was crying pretty good sounds.) I just brought out a toy and started to play with it - those picture dominoes; instead of matching the dots you match pictures. Pretty soon he played too, and the first session we never said a word to each other. I just figured that life was pretty strange and scary. Sure enough, next time I came he went right to the bag and pulled out the picture dominoes. I still did not talk. Eventually we broke the ice. He broke down and cried, and what came out was that he was just plain scared; he could talk, but it was so strange. He had lived on a farm. There were 35 or 40 children in that class; he had never been around that many children and he was just frightened; and his way was not to talk. I naturally worked with the lady in the lunchroom who spoke Spanish and she talked Spanish to him and this helped; and eventually he began to talk in class. But he was a speech problem, wasn't he? He was not talking. Now you might very well have this type of child.

Most of the delayed speech children will either be in clinics or in special education classes, and depending on whether your correctionists are working with special education, you may or may not have delayed speech cases. In Boulder they do not do too much with special education. You have to remember that delayed speech children are not all mentally retarded; this little fellow was not. It is true the other way around - many mentally retarded children are delayed in their speech, but not all delayed speech children are mentally retarded.

We had a little fellow in the clinic who was preschool age, 3-1/2, and had never made a sound; he cried silently, he laughed silently. His parents brought him to us and we sent him down to the medical school for a complete check-up. They do a very fine work-up at the medical school, neurologically, psychologically and psychiatrically - the whole bit with the families, everything. They worked him up and over and found nothing physiologically wrong with him. They gave him back to us and, "He is not talking; he is your problem". I gave *him to a graduate student and cautioned her about several things. I said, "Do not demand speech from him; do not demand speech by trying to sneak it out of him." You know we do that, don't we? We do not just say, "Say this, say that," but we will be reading a story and then we will stop and point and expect the child to respond. That is the sneaky way; that is what I call the covert way. There is an overt in which you ask the child, "What is this?" as you are looking at a book. You are asking him to talk, or you try the other way and try to trick him into talking. We had noticed while he was being tested that he liked trains and cars, so we had a wooden train set, much better than the mechanical ones. The electric trains are for daddys, but the wooden ones they push themselves are for kids. We put one of these on the floor and our graduate student was told to sit on the floor. He was being seen three times a week, and it took three weeks. She sat on that floor and played cars and trains with him and talked only when it was appropriate to what they were doing. What do you think his first word was? "Car." What we found out was, we think in looking back, that he came from a very complicated family situation. The mother had been married before, the father had been married before, they each had children from their first marriages; he was one of 12 children; there were 9 from their other marriages; he was the first of their marriage and he had 2 younger siblings, one 2-1/a and then a baby. This was his world and it was too much for this little fellow, and his way of working it out was not to say a sound. They were nice people, they had all tried these tricky ways to get him to talk. Mother ran around calling us miracle workers. You ask, "What did we do?" We sort of 'hunched' out the difficulty.*

Today it is a success story; he is in the public schools. We had him sent to a preschool as a scholarship student (the family really could not afford to put him in a nursery school). We had him for about six months. Then we placed him in the preschool, and he went on to public kindergarten. He is a very bright boy. He did very well on all the tests so long as he did not have to talk; he understood, and he is doing beautifully in school.

So delayed speech - delayed language - twins sometimes will do it too, you know. They have languages of their own. In one of the classes I teach at night at the Extension there are two sets of twins belonging to some of the students and both parents (one was the father, the other was the mother) reported that their twins talk their own language and they understand each other, but nobody outside does. Part of this is that they just love the feeling of sound. This is what is so nice about nursery rhymes, Mother Goose, etc. They have lost their political meaning which they had in other times, jokes about the king, etc. but the kids just love to roll them around in their mouths.

When parents do not understand their child, you try to find out if he gets along with other children. Usually other children understand little children when adults do not, and the children will interpret for the parents. The older brother and sister will understand a little one and parents will then begin to talk only to the older ones and say, "What did he say?" This kind of thing we find in delayed speech. Parents will bring in a child - four children in the family, three sisters and then the little brother - and the brother is not talking. Why? The *three chatty sisters are talking for him. Many times it is that way. Or the family comes home and the only time they are all together is at the dinner table. Daddy sits down, mommy brings the dinner, and Dad says, "O.K., Sussie, what happened in high school?" She goes on about the football game; then, "Jim, what went on in junior high?" He talks about the assembly they had; and then the little one in grammar school talks about Valentine's day and she got 20 valentines, etc. And there is junior sitting in the high chair at the table. What has he got to talk about? What was new at the sand pile? Nobody listens to him; he does not get a chance.*

This is why we have to know, as speech correctionists in the schools, as much as we can about the children. It is not just what is going on here - because these same factors edging in from all around can affect the child who has only an articulation problem. What if the child is saying 'wabbit' for 'rabbit'? This is his one articulation problem. It is not just that he is saying 'wabbit' for 'rabbit'; he is being teased about this. Maybe his older brothers and sisters are teasing him; his parents do not understand him; they get annoyed. They, in a sense, punish him because they are annoyed. A look can hurt, a tone of voice can hurt; and maybe this child is being punished in these ways. And I will confess to you some of our speech correctionists in the schools do not always have the time to learn enough about the children. This is where we hope you can help - to give them more time for parent interviews, to check records, or maybe you can do these things for them, depending on the correctionist that you are working with. When a correctionist is seeing 125 children a week, as we see in this part of the country, we need help. We correctionists have a joke: we say, "Good morning, little boy. What is your name and what sound are you working on?" Is that correct when she does not know his name and does not know what his problem is? Eight schools are covered by some correctionists; their office is in their car. I have started out by saying that you are part of an experiment, and we hope to prove that this can be helpful, so how about getting more aides to help? We just do not have enough funds to make you available for everybody, so we are using you as an example to show that you can be of help in schools and improve these programs by your presence.

The other side of the coin - not just that the medical problems are increasing - but we have many more pressures and tensions in our society. The incidence of migrain headaches among elementary school children is rising; also ulcers among elementary school children - some of it may be physiological but a lot of it is pressure. We know that with some children their safety valve is their speech disorder. It may not have a physiological reason; they may not have lost their teeth but they are still saying 'fun' for 'sun'; and it may be their safety valve because of the pressure. Schools themselves are increasing these pressures. At the other end, suicides and drug use among college students are caused by these pressures; we have students jumping out of windows because they just cannot take it any more. Some speech problems are an answer to pressure; the incidence is going up. You were told that some 5% of the school children have speech problems; this is nationally. Well, it is the largest part of special education. There is the orthopedic area, the M.R., the emotionally disturbed, the hearing problems, sight problems, and speech problems. Of these six special *education areas, the biggest is the speech area. When I worked in the schools, 5% but not in some of the suburbs. Broomfield, for example, which is suburbia USA - I was running 8%. Why? There are pressures to perform, so speak well, especially of our little boys. The overwhelming majority of children who have speech problems are male. We will see more and more of these problems unless we can relieve the pressures; and let us hope you can help, because all of our specialists are in the business of relieving pressures.*

What you can do as parents is insist that the schools do not put on so much pressure. It is not necessary to have groups; there is a whole new way of teaching reading and other skills. The British system has put us to shame. As you saw in speech development there are differences in the way children grow up; and some, especially the boys, are not ready to sit in chairs and work those interminable work books. Schools are only a reflection of what we, as parents and as society, ask them to be. They do not lead; they follow. You, as parents, must say, "We do not care whether our children learn to read until they are ready to." Kindergarten means a garden for children - a play place for children - and we are now teaching them to read. The big push all started with Sputnik, just so we can get to the moon before the Russians! We wanted to make scientists out of many of the children.

In most cases the children like coming to speech therapy and it is up to us speech people to make it so much fun that they want to come. In most classes it is fun and other children will say, "May I go too? Jimmy is going and I want to have my turn", even though he does not have a speech disorder. But every once in a while there is a child, and every once in a while there is a teacher, who is annoyed because Jimmy is going out and she was just going to teach a new arithmetic problem - "I forgot. Do you have to take him now?" This kind of attitude then seeps into the children. I was a good speech correctionist but there were a few who did not like coming. Even the kind of child that that particular one was; this is part of what led me to my research which is a way of having the kindergarten teacher do things in her room that are fun kinds of things which make the children aware of sounds and speech. Those children do not have to be taken out for speech correction; but it has to be fun and it has to be meaningful to the children or they will not want to come. You have to help that, too, by not being a threatening person. Something you have to think about is that you are one more adult in that little child's life, so be aware of these things since it is a thin line we walk. In most cases it is fun, and most correctionists are able to reach their children, and most teachers are cooperative.

We have been discussing competition - even to get into preschool (such as the Montessori Method). So much pressure is put on children that they are dropping by the wayside; we lose one out of three because that many of the children who come into public schools today do not graduate. As specialists it is our job to make school a better place and give them the skills, the feeling, and the attitudes that are healthy and wholesome which will not add to their problems. It behooves us to make speech fun and exciting so they will want to come rather than: "I do not want to go to school today because I have to go to speech."

You will not see as much of delayed speech in the schools as you would if you were in a clinic. You will see the next area of speech disorder, which is articulation. This is the big one. There are four kinds of articulation problems: 1) omission: he leaves it out. He might say 'bi-cle', he has left out the c-c-c sound. 2) addition: this is the child who adds a sound. He might say 'skun' instead of 'sun'. 3) distortion: this is the kind of child who may have this kind of lisp, he is making an /s/ but he is distorting it. 4) the major one of the artic is substitution. He says 'fun' for 'sun' or 'wabbit' for 'rabbit'. You see he is substituting a 'wa' for the 'ra', or he might say 'franksgiving' for "Thanksgiving' - this too is an artic problem.

Why does he have an artic problem? I think we have been touching on the 'whys'. He might be missing those two front teeth. He might have something physiologically wrong that keeps him from saying those sounds. He might have a problem in the area of what we call the functional. He has learned it wrong; his mama says it wrong; he talks like the person he identifies with. Usually it is mama or daddy, but it can be an older brother or sister, a grandparent, a baby sitter, a nextdoor neighbor, an aunt, an uncle - whoever happens to be his special person.

I remember one young boy I had who had the strangest /r/. I got him when he was in third grade and I would keep thinking about Mark at night at home. (His name was Mark and he said Mawk) It sounded like a French /r/ sometimes. One day I said to his mother, you know Mark's /r/ sounds like a French /r/ sometimes. Her face lit up and she said, "Do you suppose this had any connection with the problem?" His great-grandmother had lived with the family for the last years of her life and those were the first three years of Mark's life. She spent all her time with Mark and she was French; and he had picked up the /r/ from her. She was the one that he identified with and imitated. He was already in the third grade and people were teasing him. He was a very bright boy, but he had stopped talking; he was not responding in class because people were teasing him. He was aware that he was not being understood but he did not know why.

Another area where we have had delayed speech and language, which you will not have too much of except perhaps in predominately Spanish areas or Negro areas (Negroes talk another language among themselves) is voice problems. There are four different kinds. First is pitch: your voice must be appropriate to your sex, your age, your station in life. So you may have children who speak too high or speak too low in pitch. Second is rate: a child might speak too fast. Third is loudness: a child might not be easily heard because he speaks too softly; or he might have a booming voice, too loud. The fourth is the big area of quality: hoarseness, harshness, nasality - here would be the cleft palate you see. And with voice problems we must always have these children checked by a doctor because there might be some physiological cause. It might be allergies, it might be some polyps or nodules; we just do not know. Tonsils, adenoidal tissue, these things could produce a problem. We do not do quite as much as we should do with voice problems in the public schools. In fact, we are going to have a seminar in March for public school correctionists to alert *them to voice problems. It is a very ticklish area. The big factor can be physiological; another huge factor is this functional, psychological area.*

I always like to tell students of a story of John F. Kennedy. We happened to be living in the second Congressional district in Massachusetts from which Kennedy first ran for Congress. We went to hear his first political speech. It was a disaster; I have never in my life seen a more frightened, more tense individual than John F. Kennedy. His pants legs were waving because his knees were shaking and the prespiration was pouring off him and his face was so tight, it was embarrassing. You just knew this was the last place in the world he wanted to be, and of course that was the truth. He had not been groomed by his family. It was Joseph, Jr. who was to have been the politician and John F. Kennedy was going to be the writer and perhaps teach; he was the intellectual of the family and they never bothered training him to be a public figure. But Joseph was killed and the scepter passed to the next in line and that happened to be John F. I did not hear him again until he came briefly on television in 1956 at the Democratic convention. I think he gave a seconding speech for Stevenson. Then he began to run for president, came out to Denver, and we went to hear him at the Denver arena. He got up before thousands of people and he was much improved. He had a speech pathologist with him during the campaign, Pronovost of Boston University, who was his consultant. The voice problems we impose on our presidential candidates are terrific; they wear themselves out and their voices get tired. But when Kennedy began to make it, his voice quality improved. I wish I could have taped him. His register dropped as he began to feel more comfortable in public. So there is that area too with voice problems; it can be physiological but a lot of it can be psychological.

(Kennedy's particular speech deviation was described as a 'floating /r/'; he left it out of one place and put it on the end in another place.)

I say to my teachers-to-be in speech correction for the classroom teacher, "How many of you have ever thought that you would have a cleft palate child in your class, a cerebral palsied child, a Spanish-speaking child, or a child with one blue eye and one brown ?" We all think of teaching white Anglo-Saxon, Protestant children, all clean and beautifully dressed with starched dresses and little ties and short pants and all looking alike. Well, there just are not such classes anywhere. Your class is going to be individual, different children, and the minute you begin to think about them as all one group and all the same, you are not teaching; you are just preaching. Next to parenthood, teaching is the hardest job in the world - and correctionists are speech teachers.

You are going to have cleft palate children in the schools. This is the child who has a crevass (a hole) and he cannot make that velar closure. He may have a cleft lip, which you call a harelip (but cleft lip is a better term). When this happens it is a birth defect which happens in utero as the child is developing. Something goes wrong and it does not come together. Sometimes the lip does not come together; sometimes the lip and the velum; sometimes the lip is all right and it is just the soft palate. You have to watch and you have to listen because you will hear that honking speech. This child needs a lot of help; this is *where you can help to relieve the correctionist. You know now most of our cleft palate children are grouped with the articulation problems. They are seen once a week for 20 minutes, so if you can help relieve the correctionist, who is the trained professional, she can give more time to helping these children and it will be worth while. Their first help is surgery, and it really takes a 'cleft palate team' of specialists to help the child. They all get together and decide what is best for this particular child; the surgeon, the orthodontist, psychologist, pediatrician, the family doctor, the speech pathologist - depending on whether there is a multiple cleft, whether he is involved with the lip, his dental structure, the hard and soft palate, whether it is the velum alone, or how much of a cleft it is. These are all individual and very expensive decisions. This is why the Crippled Children's Society does recognize cleft as a crippling disorder and will underwrite the expenses of families who cannot afford treatment and bring them to Denver, the only place in this area where help can be secured for the cleft palate child via the team approach.*

You have to understand that the correctionists are fearful about your coming. Have you talked about them? When there are these kinds of things, I try to put myself in the other person's shoes. So I say to myself, "How would I have felt about having a speech aide when I was in the schools?" I know I would have been a little uneasy, wondering what kind of person she might be. Would she be willing to do the kinds of things I felt had to be done, to help me with some of the routine things, to do some of the simple things so that I could have more time with parents and teachers? You see each correctionist is going to be different; I thought of it in terms of how I would have used you. It is just as I described that room when someone new walks in: you are new, and how are you going to fit in? Liking and understanding people is the primary things - if you get along person-to-person, it will be mutually helpful for both of you. Remember personally, you have got to put out; you must help her. Naturally she is the professional and you have spent only three weeks. You just cannot feel that you know so much that you can tell her. You are both there to help the children.

Cerebral palsy children represent a very small percentage of the population. You might have one child who is not in a wheel chair who might have involvement in just one limb and might also have speech problems, because this musculature of the extremities is involved and the speech could be involved. Many C. P. children do have speech problems. Most of the severely involved children, of course, do not come to the public schools. They go to the United Cerebral Palsy Center and Denver special public schools. But if you do have one or two, these children need a lot of relaxation. This is a major concern, since they exert so much energy to do things. Two major types are spastics and athetoids. The spastic child is one that 'wiggles' and an athetoid is one with 'snake' movements. So it stands to reason they get tired more easily, but they need to do things in the correction room. If you have children doing difficult things, you have to remember they need to do these things too. I always tell teachers the C. P. child has to have something to do in the classroom too. You do not have him take a precious watering can and water the plants if he has involvement in his arms, but you can certainly have him do the erasers. So you find what is appropriate for him. A lot of these C. P. children have voice involvement. The sound that is most misarticulated by C. P. children is /s/, but that is the one most misarticulated by everybody. They need to be accepted as people and the major concern is that we do not do too much for them. In the C. P. schools we have found that the families have done too much for them. There is a lovely story that Van Riper tells about an adult C. P. who learned to ride a bicycle and he said, "My parents never even let me try." Better to break your head than your heart. You go down to the C. P. Center and you will see these children doing phenominal things simply because somebody thinks they can and should. You will not see the most involved ones, and they can be quite, quite involved. These are multi-handicapped children and you will not see them in the public schools.

The last area that I certainly want to talk about is stuttering. It can be a simple problem, and it can be a difficult problem. Stuttering is a dramatic problem. I love stutterers because they are so much more sensitive than the rest of us. You have been told that there are many different reasons for this. More books have been written on stuttering than any other speech problem. Stuttering can be a breakdown in any of those four processes I first told you about. You could have a stutterer who was involved at the respiration area, so tense that he is breathing wrong and speaking on inhalation; he could be involved at the phonation level; he could be involved in articulation - he could get stuck on his /s's/; he could be involved on the resonation level, the quality. I think for your purposes in the schools you ought to think of stutterers as made, not born. This is an area where the environment at the elementary school age level can do a great deal to help. We do so much with stutterers that is wrong - not because we mean to be unkind, but because we think we are doing what is helpful. Parents and teachers will supply the word. A child gets stuck, and the teacher says 'stuck' and thinks she is helping him because he has had trouble. Or the parents will say "Stop and start again", or "don't talk so fast. Take a breath. Think about what you are going to say,". These are the wrong things to say. You must wait them out; you must not give them the word, and you must look at them. They talk about 'monkeys on their backs' and avoid them; they go through all kinds of tricks to avoid speaking situations, to avoid words or sounds they think they are having trouble with. Some of them have two lists of vocabularies that they have memorized. "These are the words that I can substitute." Think of the energy they use; and they are so conscious of speech and speech fluency.

All kinds of tests show us that when they evaluate a person the first thing they notice is whether the person is fluent or not. Not what he looks like, but how does he sound? Is he fluent? That is the single most important thing in their lives. So in the lower grades it is important that we prevent a stutterer from becoming a true stutterer. You are much quicker at labeling somebody a stutterer than I would be. There is a whole school, the Wendell Johnson School, that says it is the parents that make stutterers; if the parents correct the child enough times, then this normal kind of speech 'falling' as I call it, is labeled stuttering and it becomes dreaded; and the more he tries not to do it, the more he does it. You wait them out and you find one word and build on that. You do not say to him, "Start again." A child cannot go from creeping to walking without tumbling; he cannot learn to talk without 'tumbling' too. This period from *about 2 until age 6 is the normal verbal 'tumbling' that children do as they learn to talk. Boys do it more than girls.*

Every stutterer is different; there is no pattern for all of them. Every stutterer has words that are his dreaded words; and what he is afraid he will do, he does. If he could be indifferent about how the word comes out, it would come out smoother. It has to do with age and how he is reacting to what is going on. This has more to do with his situation than how often he does it. It has to do with whether he is involved in other ways too. There are two levels of stuttering; primary and secondary. It takes careful counseling of the parents and the teachers by the speech correctionist who is the skilled professional worker. She should have the time to do it.

(For this presentation an anatomical model was utilized.)

Evaluation of Speech and Language Disorders by the Speech Specialist

Karol Kay Merten

Every day of our lives we make such statements as, "It is a nice day today." "George is a good business man." "Mary can read very well." etc. We make, in essence, value judgments; evaluative statements, if you will. We evaluate some modes of behavior from our own point of view. We have offered no reference points, we have made no definitive statements in terms of comparative behaviors - but rather we have offered an opinion - a point of view that categorizes or evaluates a person, an object, a thing, or perhaps a piece of behavior. Hopefully we can see from this example that value judgments, evaluative statements, are highly individualized. It necessitates some kind of viewpoint, some type of reference point. The evaluation of speech and language does not differ. It is a highly individualized task.

Those of you who will be exposed to speech and language evaluations for the first time will experience differing techniques. They perhaps will range from the opinion that evaluations take too much time and are unnecessary - let us get on with the therapy - to the point of view of let us test, test, test. And so today I want to talk about a philosophy of evaluation rather than a specific technique of evaluation.

I have indicated that evaluation is an assessment of behavior based upon reference points, which denotes a range of behavior - which, in turn, must be evaluated relative to a continuum. It is not black or white; it is not either/or; it is not Aristotelian by any stretch of the imagination. Behavior is relative and must be evaluated in terms of a continuum; perhaps a continuum ranging from never-present to always-present relative to speech and language.

When we evaluate, we are interested from two points of view. First we are interested in some classification: either the behavior is adequate or it is not adequate, and we need some normative data to make that interpretation. Second we are interested in the extent of the limitation as it relates to contributing factors and prognosis. There is a need to evaluate horizontal development - normative information - which is a comparative type of evaluation - as well as a vertical evaluation of the self. There are several contributing variables which are always kept in mind: the sex of the client, social-economic status, the type of stimulation to which he has been exposed, and the structural integrity of the individual. If you are talking about children who do not speak well we are primarily concerned with, "Does he have the oral mechanism and the aural mechanism?", assuming the basic integrity of the central nervous system. I purposely place structural integrity last because I sometimes feel if this is in the forefront of our thinking, then we block out other possibilities. The structural integrity, in part, is based upon the individual's ability to successfully use the structure that he has.

What do I mean by that? It is probable that few of us have adequate structure to really speak well and learn language well, and yet we have enough things going for us to compensate so we can overcome these limitations. If someone were to look in my mouth to see the structure of the oral mechanism, they would look at my overbite and perhaps say, "You must not be able to speak very clearly because you have a tremendous overbite." However, I have been able to compensate and thus the evaluator should not make note of my structural adequacy first. He waits and looks at the performance of the behavior he is testing (specifically speech and language) and then relates that back to my structural integrity.

In evaluation we are not only interested in learning the weaknesses (what this child cannot do), but also in what are his strengths. What can he do? From the philosophical point of view, that evaluation is a two-sided coin and too often we deal only with the one side. We deal with that which he cannot do, making further assessment of those things which he cannot do, and sloughing off on the things that he can do.

The evaluation uses: 1) case history information, 2) test performance, and 3) observation. I place observation last because as you write these things down, hopefully it will appear as a necessary foundation for the others. If I had to choose just one aspect of gathering information for evaluation purposes, there is no doubt in my mind that I would select observation as the primary contributor. Thus, from my point of view, evaluation is not something that you do one day and therapy something that you do the next; they not only complement one another, but are so entwined that you really cannot separate one from the other. Because evaluation, as I see it, is a dynamic on-going process that starts the first time you see the child and goes on until you dismiss him.

With these thoughts in mind, then, let us go to specific evaluation. I will spend the most time talking about the evaluation of one speech disorder - articulation, because it is the most common. In a public school setting it takes on primary importance because frequently the school speech specialist refers to another school clinic or a clinic in the community those problems in other areas, such as stuttering, voice, and language. As we look at these parameters, articulation, language, voice and prosody, let us look in depth at articulation disorders and evaluation thereof.

Articulation, by its very definition, means the joining together, or the sequencing of sounds. It is the way we say the sounds in our words. Articulation disorders are the most common, as I have stated, and they center around three major subtypes: Distortion is the first, and the best example I can give of that is as you hear the hissing air laterally /shun/, /bicycle/, /bush/. Basically I am using that /s/ phoneme, but the air-sound stream is coming out the side of my mouth. The same thing is true if I let the air stream get kind of 'fuzzy' (if I may use that layman's term), when I go /s/, /bisycle/, /bus/, etc. That is distortion of the particular sound or phoneme.

Another common subtype would be substitution. Where the child might say a /w/ for an /r/ - /wed wabbit/ instead of /red rabbit/ this is quite common.

Another subtype would be that of omission. Omission occurs when the speaker does not even realize or note that the sound should be there. He may say /__ed __abbit/; he just omits the /r/ entirely.

There is a fourth subtype of articulation problem that I frequently omit because it happens so seldom. It is called an additive or an addition. The child adds a phoneme that really does not belong. It might be something like /sun-a/. This is frequently typical of children who have been in therapy for some time. They come into the room and start to say /sun/ - they remember to put on that /s/, but just about the time they try to put on the /s/ the old pattern comes through and they try to modify it - and it may come out /th-suna/ or /s-thun/. The /th/ preceeded the /s/ initially and then followed the /s/ on the second presentation. Either place it was inappropriate. This is an addition.

Certainly these subtypes of articulation problems can occur in any combination. A child may distort a phoneme and may substitute another time, may omit it altogether another time, etc. Traditionally one evaluates articulation disorders in three positions. I will draw for you a little rectangle shape and divide it into three equal spaces:

I	M	F
dist. 4	Θ	—

We will put over space one an 'I' for initial; the middle space we will put an 'M' for medial; and the last one we will put an 'F' for final. So if I am looking at the /s/ phoneme, I am looking in such a manner that I note its production in the three positions. For example: as I attempt /sun/, maybe I do not do it quite so well; it comes out the side of my mouth. In block one then we would put distortion. (We might write 'dist.') We might also rate it; is it really very, very bad? We could rate it 3, 4, 5, if it were. Let us put a small 4, which is a pretty lousy distortion for /s/ in that initial position. Now we come along to the medial position and instead of /bicycle/ with a nice firm /s/, we hear /bithycle/; a /th/ for /s/ substitution. We write in the /th/. The little symbol /Θ/ I am using is an International Phonetic alphabet symbol standing for a voiceless /th/. Now we come to the word /bus/ where we see the /s/ in the final position and the child says /bu/; we put a dash there, a minus sign. So we go /shun/, /bithycle/, /bu/, in that order. I have not put the addition there, but it might be there later.

As we make the above assessment of the articulation we see the /s/ phoneme is pretty inadequate, is it not? But how bad is that articulation relative to this sound? There is another facet of articulation assessment, from my point of vies on this three-position testing that should now be analyzed. There is some literature to suggest that there is an hierarchy of error that ranges downward from the correct production, being point 1, point 2 being distortion, point 3 being *substitution, and point 4 being omission. Remember we said an assessment of behavior had to be related to a particular hierarchy or continuum of behavior - that it does not suddenly go from never present to always present. Well, this is where the application of that principle can be very helpful. A child does not go from omission of a phoneme where he is not even aware that it should exist (let alone how he should produce it) to always producing it. He might go through some kind of change of behavior, where he no longer says 'bu' where he omits, but 'buf' or something. There I used an /f/ substitution. He is a little bit closer to a better production, or a correct production I should say, because he is a least aware that the phoneme exists. Now when he says /bus-s-s/ (I am exaggerating the air escaping laterally now), he is even closer, because now his production is beginning to assume some of the characteristics of that phoneme; so it is a little closer to being produced correctly. He does not necessarily have to follow that type of gradation, but it would not be unusual that he would. What I am suggesting from an evaluation point of view, is that I think we should give some kind of importance to changes of behavior that would suggest that the desired modification is taking place.*

Let me give you an example. Let us take this /s/ phoneme and give it a quantitative factor for analysis. If it is produced correctly, we would give it 3 points; if it were distorted we would give it 2 points; substitution 1 point, omission 0. We would see on the traditional 3 position testing, that the /s/ could receive a numerical value of 9, if it were correctly produced in all three positions. The illustration we used - the distortion in the initial position, the substitution in the medial, and the omission in the final, would then gain for this particular phoneme only a 3, would it not? They received 2 points in the initial position, 1 point in the medial, and 0 in the final; for 3 points. Now if at a later time, an articulation test were re-administered and we saw that he was still distorting that initial /s/, was still substitution /th/ for the medial one, but he was now using an /f/ substitution for that final position, the new numerical value would be 2, 1, 1, or 4. Some change had taken place. It is not the change that we are setting as a goal for him, but it certainly should not go unnoticed. There is more to evaluation than this one-sided coin of what he cannot do - because if we say now, "he cannot produce a correct /s/"; it is only half the story. He cannot, but he is making some improvement.

We record this information on the sheet labeled Phonetic Inventory, a PI in school language. There are several "tests" on the market, if I may use that term rather loosely - the Templin-Darley Articulation Test, the Laradon Articulation Scale, to name but two. From my experience in the public schools back in Kansas, and then from my experience in observing the public school specialists in the Denver area, it is likely that the school specialist will use a set of self-made stimulus pictures to elicit these oral responses.

This information is related to developmental information. We know from normative data on people like Mildred Templin, that acquisition of speech like any kind of behavior, develops systematically and that levels of proficiency are achieved relative to chronological age levels. So we have to know something about *normative data here. We must look at the data and say, "Is it adequate or inadequate for his age group?" Then if it is inadequate, let us go vertically and evaluate the extent of this inadequacy.*

We must now compare these test responses with his conversational speech. What happens when he "winds up and talks"? Usually there is a difference in his proficiency. Up to this point we have emphasized inadequacy - what he cannot do. Now we want to switch to the other side of the coin - what he is able to do. We look at his stimulability. Can he imitate in oral stimulation? Can he do it in some kind of meaningful sequence? Can he go from imitation of a single sound presentation, perhaps through nonsense syllables and words? Under what conditions is he able to correctly produce the phonemes with which he has difficulty? In my opinion, one of the best tests on the market to find out what he can do is the MacDonald Deep Test of Articulation. Actually, this test was designed to locate the phonetic contexts in which a sound might be correctly produced. It focuses on the influence of the sounds that precede and follow the 'target sound'. It gives information about the phonetic context which facilitates his own spontaneous correct production. I think too often we get involved in doing therapy and we do not really listen as well as we could. We are listening for specific responses and we miss certain responses and observations of behavior that would be very helpful. This is where I think the speech aide could be vital. The person on the outside, so to speak, who is observing a therapy session can frequently be more astute in making observations because he is not promoting the interaction, but rather analyzing it. I think we are in a position to have you be extremely active observers of the behavior - that should lend a great strength to the quality and depth (if I may use that phrase) of a therapy session.

It is imperative, as I have implied, for one to evaluate the patterns of behavior. When I am talking about patterns of behavior relative to articulation, I am not just talking about how the child uses this phoneme across its positioning - if we go back to the traditional three positioning testing - but also within a position; every time he comes to a final phoneme, is it out? When it begins, is it in the initial position - or what is the pattern. Finally, all of this must be related to the structural adequacy or inadequacy of his speech mechanism. This, then, is my point of view about the assessment of articulation disorders. It is no different from a general philosophy that I would have. Evaluation of this disorder is a two-sided coin. Find the extent to which he cannot do; and then find what he can do.

Let us proceed now to the evaluation of language. This is a relatively new area; it has been around a long time, has it not, to be new? But it is one in which I think we do not make proper assessments for a number of reasons. Language is a system consisting of symbols and the rules for combining them into sequences that express our thoughts. There is a triad of functions: from input, through integration or association, to output. The sensory modalities of input and the motor modalities of output have a reciprocal relationship so that anything that would impede input would by necessity result in a reduced quality of output.

We will not take time to talk about assessments of all sensory motor modalities today but will limit ourselves to aural-oral language. How well does *this child understand, or, if I may use the word, decode: what are his receptive abilities? Not only how well does he understand, but what are his abilities to form associations with the auditory stimulus? What are his abilities to find appropriate words and put them in logical word order, etc. What are his associative abilities? Lastly, the most apparent skill - what are his abilities to express himself - or his encoding abilities?*

I have already suggested to you that there exists a reciprocal relationship between input and output. Because this is true, I want to spend major time on what, from my own point of view, is of major importance. Here again, I think speech aides are vital and can be used very effectively to make assessments of the use of language. Are his utterances telegraphic? Does he deal specifically with high content words and forget all about the other little words, the nebulous things like conjunctions and prepositions, 'word connectives'? What happens to the child whose teacher says, "He just does not seem to understand what I want from him."? Maybe this is a vital clue; usually it is. The assessment of language, I think, should concentrate initially on evaluation of the child's ability to handle input. How about his ability to retain non-meaningful sequences? What about his ability to retain word order? The number of one-word responses, the structural analysis of his language, the mean length of response, are vital.

In this area it is not atypical to find a child who needs a great deal of practice on sequential material - use of non-meaningful and meaningful material, through the modalities that are intact, based on the assumption that it is imperative that he retain information. This, again, is where I think the speech aide can be utilized so greatly. This is a very brief sketch of language assessment, but I think we have to do it in a logical order; that is, taking a language sample, analyzing it from a point of view of mean length of response, number of one-word responses, and structure. We could use such tests as the Pebody Picture Vocabulary Test, which is a receptive vocabulary test, or we could use the ITPA, The Illinois Test of Psycholinguistic Abilities; but again, more fundamental than that is our need for evaluation and assessment of language behavior to center around measures of verbal output.

The third parameter is that of prosody - rate-rhythm; stuttering. Here again I am going to be brief because assessment and evaluation of stuttering behavior is so very, very individualized that it is extremely difficult to even talk about a philosophy. I think that I will restrict it to four major areas necessary for any kind of beginning. 1) You need a description of the behavior; what kind of stuttering behavior is occurring? Is he blocking? What kind of a block do you see? What is its duration? Is he prolonging? What kind of prolongation? Is there repetition? If so, what kind of repetition? Repetition of phonemes? Initial phonemes? Repetition of words - syllables or phrases? 2) The next general area would be, what are the secondary symptoms? What happened at this instant of stuttering? Is there an accompanying eye blink - facial grimaces - foot stomping - describe, again, the behavior of secondary symptoms. 3) The third area I would be concerned with would be the conditions under which dysfluency is noted. For example, if he is reading, is he fluent? Is he more fluent *than when he is just talking? When he is singing, what happens? In an off guard moment, for example, is he fluent? What conditions might tend to modify the stuttering behavior as you observe him? Again, I cannot emphasize too much the necessity for observation - for speech specialists and speech aides alike, to be active observers. 4) The fourth area would be some kind of evaluation by the client. How does he evaluate his speech behavior? What priority does he place on fluency? What does fluency mean to him?*

The final parameter is that of voice. As I have talked with a number of public school speech specialists throughout the Denver area, there is general agreement that voice clients from the school system are usually referred out to clinical settings. I am simply going to say if a voice client is referred to you, your evaluation should be preceeded by a medical consultation; thus, any voice evaluation done by the speech specialist should follow medical consultation.

Let me summarize. Evaluation is a dynamic, on-going process. It is highly individualized; it is composed of case history information (information gathering), test results, finally - and the most important - astute observation. The speech aide, from my point of view, can play a very important role in the evaluation process - if not in actual testing at least by effective, astute observation of behavior under varying conditions - because speech and language problems vary as all behavior does. Children vary in their ability to cope with high pressure testing sessions. You may catch them off guard and hear language and speech taking place that you did not know existed. If so, analyze, evaluate, and assess that behavior under that condition.

Rehabilitative Procedures for Speech and Language Disorders

Mary E. Hull

We will start with some of the speech and language problems most commonly found in the public schools. Although the articulation disorder is not by any means the only type of speech problem found in the schools, it is prominent in the typical public school case load. Previously, in this series of lectures, you have had talks on child growth, and speech and language development. Now you should be somewhat familiar with the way in which a child learns sounds and the process of words developing in a child's vocabulary. You have learned something about the speech mechanism, how voice is produced and how the articulators are involved in producing speech sounds. You have had some discussion on just what a disorder is, and what the various types of disorders are. You have also had some information presented on the evaluation of speech and language disorders.

Let us make it very clear that the methods which we are going to talk about today have been developed in several different ways. Of course, the speech correctionist has been greatly influenced by the training institution he attended as well as by the professional publications he has read and by professional meetings he has attended. Although he is aware of the background he has had in his courses and in his college clinical program, he does tend to develop many of his own techniques through observation of children and through trial. Many of the procedures that are used in the public schools are developed by the speech correctionist, often during a child's lesson. A child's reaction to a particular lesson situation may suggest an entirely new approach to teaching the production of a sound difficult for that child. When these new techniques occur, it is wise to make a note of the procedure for future use. This points up how individualized the approach must be. The correctionist must think of the child, the way he is talking and responding and evolve the best approach to achieve desirable speech patterns from this child.

Before discussing specific procedures for children with articulation disorders, let us talk about the overall therapy program in the public schools. Some children receive lessons on an individual basis and some in small groups. In our own program our groups are very small indeed. We work with two or three children, occasionally four children, but we try to limit group size because time is limited. We see children for two 20 to 25 minute periods per week. Some speech correctionists must see children in groups of 5 or 6. This is often due to a crowded school population with an insufficient number of speech correctionists for the size of the population. In some areas, the correctionist can attend each school only one time per week. This occurs often and this is the area where speech aides will be particularly important. Children need a trained person to assist in practice, rather than an untrained person, which the parent usually is. Of course, we need the parent's help too, in many ways; however, someone who understands more about practice techniques can benefit the child to a much greater degree.

The articulation disorder may vary in degree from mild to severe. A mild condition may consist of one sound substituted for another suth as the /th/ sound substituted for the /s/ sound. We are all familiar with the child who says /mouth/ for /mouse/ and who says /thing/ for /sing/. In addition to the sound substitution, the meaning of the word can be confused by the listener. At the other extreme, a severe articulation disorder may consist of many sound substitutions, sound distorting and some sounds may be omitted altogether. Varying degrees of severity exist between the two extremes.

When we speak of a sound substitution we are speaking of one isolated sound which is substituted for another isolated sound. We are speaking in terms of isolated or single consonants and occasionally vowel sounds. Vowels, if defective, are more noticeable in deviations of voice quality and dialect than in articulation. Whether or not a dialect is a speech problem is open to question. We do not worry too much about dialectal variances from one part of the country to another as the difference is usually not extreme enough for the child to feel singled out. In presenting the isolated consonant sound, we refer to the sound as we hear it rather than by its letter name. For example /s/ is /sssssss/ and not /ess/. The following are the consonants with which we work in speech and any of these may be found defective: /m/, /p/, /b/, /n/, /t/, /d/, /h/, /wh/, /w/, /k/, /g/, /f/, /v/, /th/ (voiced and voiceless), /s/, /z/, /sh/, /zh/, /ch/, /j/, /l/, and /r/. We refer to the position of the consonant sound in the word as "initial", "medial", and "final". Note the position of the /r/ as it occurs in three words, /rabbit/, /very/, and /car/. In addition to the consonants, the therapist must know the long and short vowels and the diphthongs (a, e, i, o, u, ow, oy).

In the initial lessons with a child with an articulation disorder, you must look at the 'whole' child and determine whether there are problems in addition to the misarticulated sounds. It is necessary to check emotional problems, orthodontic problems, or anything which appears to be organic. You must eliminate any possibility that there is a basic physiological or neurological reason why this child should not be able to produce sounds correctly. We must establish that this is a functional disorder. We may not be certain of the cause of the misarticulations but we can determine whether the articulators are functional. Occasionally, there is a problem called 'tongue-tie'. People frequently ask if this is the major cause of speech problems. A person not in the field will assume that the tongue must be tied to the bottom of the mouth or he would be able to produce sounds correctly. There is, on rare occasion, a condition in which the frenum is very short or appears to be almost non-existent. When the child is asked to raise his tongue tip, the tongue tip seems to be pulled back into a 'vee' or the tip seems to 'dimple'. The child is unable to make the correct contact of tongue tip to space just behind the upper front teeth to produce the /n/, /t/, /d/, and /l/ sounds. This is an extreme condition but does illustrate that the therapist must determine that these movements are functionally possible before attempting to teach them.

There is another condition in which the tongue simply does not function precisely. It is not strong. The child can move it and place it where directed *but when he talks the movements appear sluggish. This child often cannot produce the /r/ sound correctly. When you show him the position for the sound it is difficult for him because he is unaccustomed to such a degree of tongue movement. As an infant, he may have been on the bottle for a long period and developed a strong sucking reflex but had insufficient experience with chewing. It may basically be a problem of exercising the tongue and getting the sensation of moving the tongue around in the mouth.*

After eliminating any condition which should be seen or treated by another person, such as the orthodontist, psychologist, or medical doctor, you may proceed with articulation therapy. The next procedure is to identify the sound or sounds with which the child has difficulty. This is done through the testing procedures previously discussed. When you have arrived at the diagnosis, you must next help the child identify the characteristics of his error sound. He must be helped to discover that he is not saying the sound according to standard production and often it is a surprise to the child that his production is not correct. He has said 'wabbit' since he started to talk and to him it sounds fine. Perhaps he has always protruded his tongue on the /s/ sound and to him it feels right and it sounds right. Unfortunately, the /s/ sometimes does sound all right when the tongue tip is protruded. The child has learned to match his sound to that which he hears, but his protruding tongue tip is disturbing to the person who is watching the child talk and you must help the child see that he can correct the positioning.

This can be demonstrated to the child very gently. One approach is to seat the correctionist and the child in front of a large mirror, and watch their mouths as they visit. Gradually, the child may be asked to repeat some words with the error sound (in this case a tongue protrusion /s/). As the child observes himself talking he may begin to see that his tongue tip does protrude on the /s/ sound. This is a far more effective procedure than to simply tell the child that his sound is wrong. A good tape recorder is also helpful in demonstrating differences between incorrect and correct sounds. There are several good high fidelity tape recorders on the market now which are most helpful in teaching a child to discriminate sounds.

After the child has become aware, through various procedures, that there is something different about the way he makes his sound, he can accept the fact that it is a good idea to go ahead and work on it. The child's desire to work on his speech depends greatly on your approach to him. He must feel that it is interesting; that there is no stigma attached to it; that there is nothing wrong with him; that when he comes out of his room to go to the speech session he is going to do something stimulating and perhaps a little exciting. Essentially, now, we are speaking of motivating the child. A lot of times, people misinterpret motivation and think of it concretely in terms of what will be done today to keep the child's attention on his lesson. This is not motivation. When a child is motivated to learn how to speak correctly, he must desire this change with his whole being. He must set his standard and be open to all suggestions which will propel him toward his goal. The various games and devices which the correctionist uses may help keep interest from lesson to lesson. Basically, the child comes *to speech class because he wants to learn to talk correctly - playing games makes it fun. The speech correctionist's role in building this proper attitude is of great importance.*

The first steps of articulation therapy, wherein the child is learning to recognize and discriminate sounds, is generally referred to as 'ear training'. This involves listening. The child is learning to talk by listening. First, he must learn to recognize his own sound, then to differentiate between two sounds which are very much alike. There are many games and interesting devices for teaching discrimination. For example, several /s/ and /th/ pictures may be turned face down on the table. The child is then asked to turn each /s/ card face up. He will leave the /th/ cards face down. At first, several errors will occur and the correctionist will continue to point out the different characteristics of the two sounds, until the child's ability to discriminate has sharpened.

The child also learns to recognize his sound in words. For this exercise, you might read a list of words from a drill book and ask the child to signal when he hears his sound. The signal may be a buzzer, or one of those little crickets used at Halloween. At Christmas time, little bells made of red construction paper may be used - if the child hears his sound he 'rings' his bell. The same devices may be used with a phrase or sentence. For example, in the sentence, "Let us go swimming on Saturday", the child may hold up his hand, or tap a finger on each /s/.

As the child becomes fairly consistent in recognizing his sound he is next asked, "Did the sound occur at the beginning, in the middle or at the end of the word?" As a device for this drill, some correctionist~~s use a ca~~rdboard train, the engine for words with the sound in initial position, the box car when medial, and the caboose for the sound occuring in the final position. In addition to such devices, the children may make notebooks. You will probably be asked to look through magazines and find all the pictures you possibly can involving words in which the child can recognize his sound, and identify the position of the sound in the word. The children often enjoy bringing pictures from home for their notebooks.

The speech correctionist may have excellent materials but the same materials cannot be used constantly with the same child. Each time the child is seen, the lesson needs to be varied, either by varying the materials or the approach, even though the goal will remain the same. Occasionally, a lesson may be reviewed using the same materials, in which case it is wise to vary the activity. Pictures may be cut out and mounted on construction paper of various colors. These may be hidden around the room and the child is asked to find the ones containing his sound. There are innumerable activities which can be worked out to keep the child actively participating and yet keep his attention directed toward learning speech. Many children offer good suggestions for speech activities which can be used to good advantage. In this entire process you are constantly stimulating the child with his new sound - he hears this sound for 25 minutes, two times each week and you wish him to be aware of it when he hears it in any situation.

Many of you will be in speech classes with children who do not discriminate sounds very well. There are some children who never do learn to discriminate accurately. A wise speech correctionist does not continue this process overlong. Sound discrimination is simply one step which is to be integrated with other steps. During the same lesson in which an ear training procedure is being used, the speech correctionist may go ahead and work on the exact positioning of the tongue for sound production, or some preliminary tongue exercises for the sound. If the child has been protruding his tongue, he may work in front of the mirror to help him see other locations for the tongue. The emphasis here is that you do not wait until you have completed all steps of ear training and the child has become an expert in sound discrimination before you begin direct work on sound production. He might be in speech class forever if you did that, because he might never learn to discriminate well, though most children show some improvement. Some children become proficient in two or three lessons.

The ear training approach which we have been discussing is one suggested by Charles Van Riper - a workable one for speech correctionists. His book is so well written that students in speech correction feel they can read it and have a recipe to follow. Actually, he does not mean that you follow his book step by step - he presents ideas and suggestions, and with experience you learn how to apply these when you need them.

After the child has had some experience with ear training, the sounds are taught in isolation and other various materials are used for that procedure. One ingenious device is called a "Tok-Back". It is placed over the mouth and ears. The child speaks into the mouthpiece and the sound is amplified in his ears - very simple and effective. The child hears your stimulation then he makes his response which he must learn to monitor. The amplification keeps the child's attention very closely on his sound and aids him in making judgements and comparisons.

A small mirror is useful, too, because it does focus the child's attention on the exact area of the tongue, lips and jaw. A large mirror can be distracting because the child can then see the room behind him with objects, colors and movements. At this time you want the child to attend to only the exact area in which the sound is produced.

The ordinary wooden tongue depressor is also frequently used. With this you can point ~~out~~ for the child the exact contact you wish the tongue to make. It would be a good exercise for you to attempt to make a sound differently from your usual method - this demonstrates how difficult it is for the child to change his method. But tongue depressors do give the child a definite tactile cue for tongue placement.

You should involve many senses in working with a child in speech - visual, auditory, tactile, kinesthetic. Another technique which Van Riper suggests as useful is that of "proprioceptive feedback". In this, the child may be asked to close his eyes, or you can put a buzzing sound in his ears, then ask him to produce his sound. You then check to see whether he senses that his sound is correct and compare his answer to your own judgement of the way he is making his sound. In working to correct sounds, all the sensory pathways must be kept in mind by the speech correctionist.

After the sound has been learned in isolation, it is then learned in syllables. In this procedure, the child will learn the sound in initial, medial, and final positions with the vowels. With the /r/ sound in an initial position, you may ask the child to repeat it with each vowel: /ra/, /re/, /ro/, etc. Similarly, medial position: /ara/, /ere/, /oro/, etc.; and final position: /ar/, /er/, /or/. The /r/ syllables may then be interspersed with other syllables: /ra-sho-be/, etc., similar to a word situation. By the intermediate step of drilling the sound in nonsense syllables the child is using a sound but it does not carry meaning. He is therefore more likely to use correctly the new sound pattern which you are trying to establish. It is a good thing, too, to build up speed in the nonsense syllables. You wish to achieve speed and flexibility in order to eventually fit the new sound into the child's normal speech. None of these drills need to be boring to the child - various games and devices can make them fun and children usually enjoy the drills.

After the nonsense syllable drills, you can then proceed to use the sound in words. Word lists are available with the sound to be learned in initial, medial and final positions. Here again, the speech correctionist must be inventive with various games and pictures to keep the drill work alive and meaningful.

When the child has achieved some proficiency with the sound in words, he is taught to incorporate it into sentences. The sentence, of course, is the backbone of all connected speech. It carries meaning and expresses idea. Sentences used with the child should involve vocabulary at his level, and should express ideas familiar or interesting to him. Colorful, stimulating pictures may be used to suggest sentence formation.

Practice in formal sentence structure may then be developed into connected speech, stretching still further the child's ability to use his new sound correctly. You may give the child such assignments as story telling and dramatic play. These would be structured situations in which the child is monitoring his speech - it has not yet become automatic.

The next step is to proceed to spontaneous conversation. These may be speaking situations with very little structuring by the correctionist. You may take the child on a walk around the school, or play some sort of game without calling the child's attention to his speech. This provides a check on his automaticity and his self-monitoring. You may note an error when the situation becomes unusually exciting. You may check his ability to carry-over the correct sound on the telephone. Children are usually aware that the speech correctionist is listening to them talk and sometimes the only way you can check on the carry-over is to check with parents and teacher. Children are marvelous at knowing when and how to talk correctly. They talk differently for company than in a play situation - sometimes you literally must sneak up on them in order to check the carry-over.

It must be emphasized that the procedures from ear training through conversational carry-over are fluid rather than static. The child is always in transition from one stage to the next - one thing is not stopped and then another started. The whole process should develop to the point where the child is talking easily with his sound with no conscious effort. Along with the class work, assignments for home practice are given from time to time and these are developed to parallel the class work.

Language Disorders:

Now we will talk about rehabilitative procedures for language disorders. In previous meetings, you have had some background on language, but as an introduction, let us review the concept that language includes reading, writing, and speaking. As speech correctionists we are primarily concerned with the oral aspect of language, although we cannot ignore the other areas.

There are several different kinds of language disorders. One type, termed 'delayed speech' is a condition which involves the delayed development of articulation, vocabulary and an insufficient ability to receive, integrate and express information. This child does not have the verbal ability to control his environment; for example, he may be unable to ask for what he wishes to eat, he may be unable to tell in words where he hurts if he is ill.

There are language disorders which are probably due to involvement of the central nervous system and the term 'aphasia' has been used for this. One type of aphasia is referred to as 'expressive', a condition in which there may be damage to the part of the brain which controls an individual's ability to express himself in words. This child may receive, understand and act when things are said to him, but he cannot select the right words to express himself. Another type, the 'receptive' aphasic child has difficulty in receiving language, integrating and expressing it correctly. He may talk, but his language will include much jargon which does not carry meaning.

There is much difference of opinion concerning the aphasic condition, some based on research and much on observation. Approaches and attitudes toward language disorders differ greatly. It is generally agreed, however, that there probably is not any one clear-cut type of aphasia. There is usually found to be a mixture of problems in both expression and reception. In many cases, the condition seems to have been caused pre-natally, due to some lack of brain development. In other conditions, the aphasia may have been acquired: a child may have had a bad fall resulting in severe brain injury, or the brain may have been injured during the birth process. These are severe types of language disorders and these children are seen frequently in speech and hearing clinics. There are classrooms for children with aphasic disorders because they are educationally handicapped, though often make considerable progress with correct handling. The diagnosis is very difficult: is the child mentally retarded? Is he an autistic child? Is he an emotionally disturbed child? This condition requires a team approach for proper diagnosis.

We seldom see such seriously disturbed children in the regular classroom. If a child comes in as a kindergartener and displays a lot of bizarre actions, our job then is to be aware that such a condition is possible, and refer the child for proper evaluation. Sometimes the parents have hidden from themselves the fact that this child is not performing the way other children perform. They think that as soon as he gets to kindergarten everything will be all right; however, the kindergarten teacher soon finds that she has something which is completely beyond her ability to cope with in the average kindergarten setting. So it may happen that the speech correctionist will be consulted and be instrumental in making the proper referral.

Language may also be delayed due to mental retardation, hearing loss or emotional disturbances. Many public school speech correctionists do work with mentally retarded children who are enrolled in special classrooms. Occasionally, depending upon the severity of the condition a child with a hearing loss may need some, or a great deal, of help in acquiring language concepts. Some school systems do have teachers for the hard-of-hearing child; in other schools this service is performed by the speech correctionist.

Children whose language development is delayed due to environmental influences are seen often by the public school speech correctionist. Children who have aphasic-like tendencies are also seen. These are children who show some symptoms of receptive or expressive problems but not to a severe enough extent to keep them out of the public schools. This condition makes learning difficult and is included in the general category of learning disorders, which we hear much about now. This is a complex problem and sometimes the speech correctionist works with this child in the various aspects of language.

In regard to environmental influences on language development, let us now consider the child whose grammar, or the syntax of his language, is characterized by linguistic errors. To make this very clear, think about the words that you use to talk with and the order in which you use them in a sentence. You may say, "I am going shopping", or "I will go to the store". A child whose syntax has not developed properly may say, "Me go shop", or "Me go to store". It is likely that these errors have persisted partly because they have been functional for him and no one in his environment has bothered to correct them. There may be a reversal of pronouns - for some reason the subject pronouns are difficult for some children to learn. A child may say 'me' for 'I', 'him' for 'he', and 'us' for 'we', "Us are going on a trip", This child may also omit verbs, prepositions or omit contracted sounds. He may add a sound, for example, 'gots' for 'got'. In omitting the contracted 's', you might hear a child say, "It time to go now". On casual observation, it might be assumed that the child is having trouble with the 's', yet he may be able to say, "We have six cats", showing no difficulty with the plural 'cats'. However, in the sentence, "It's a big house", he does omit the verb form 's' and say, "It a big house". So you see, in this construction, he is actually omitting the verb 'is' and not just the 's' sound. Once the speech correctionist starts thinking of these grammatical misuses in terms of language, and realizes that the child is misusing words and not simply omitting a sound, the therapy can be constructed to alter this particular situation.

Children with these poorly developed syntactical patterns, more often than not, do have articulatory errors as well. Therefore, if a child omits prepositions, if he has some articulatory errors, if he puts the object word in the subject place, he will have speech that is nearly unintelligible.

With this problem, a child may have a difficult time acquiring concepts. He may not understand the meaning of prepositions, and this may be the reason why he does not use them. He does not know what 'under' means, or 'beside' or 'on top of'. This is common among the culturally deprived and "Headstart" children. Many schools have a segment of the population in which children are so deprived culturally that communication with other children and the teachers is extremely difficult. They do not know how to use words to control their environment except right at home. This does not mean that there is anything wrong with the inate ability to learn, but these children will have a difficult time learning the things taught at school. Schools are aimed at the middle-class. There are middle-class standards of teaching, middle-class language is used and the text-books are written for children who come from homes with a reasonably good background. This situation works well for those children but is unrealistic for children who have had very little stimulation in their homes, have not been talked with, have never been for a ride and had Daddy say, "This is where the bank is," and "Here is the Post Office. Remember the postman who comes and picks up the mail at our house? He brings it to the Post Office." You may think that any child would know this process, but they do not if they have never heard it discussed. Maybe the only thing they have heard in their homes is rough language. The vocabulary they have learned at home, they find, cannot be used at school. When the child comes to school and the teacher talks about breakfast, lunch and dinner, the child is unaware of the various foods which fit into each category.

So far we have been discussing English speaking children. Now, let us consider the child who has a bilingual background. In this part of the country we are particularly concerned with children from homes in which Spanish is the major language. It is sometimes found that a bilingual child may have a low vocabulary in both languages. His Spanish may be as limited as his English, if he comes from an uneducated and deprived background. On the other hand, he may have a very good command of Spanish, but the family may have spoken only Spanish in the home. When the child comes to school, he is taught in English, a language of which he has little or no knowledge. He will begin to develop some vocabulary, but comprehension and concepts in the second language are very difficult. These children are usually held back in school until they have learned enough English to have a better grasp of the material being taught.

Whether or not the speech correctionist schedules cases of bilingualism depends upon how crowded the caseload is. At the present time, other types of cases do seem to have priority. In some cases, the child may have only dialect errors. He may speak and comprehend English fairly well, but he may be difficult to understand because of numerous dialectial errors and often a fast rate of speaking. The /d/ is often substituted for /th/ (voiced), and the /sh/ and /ch/ are interchanged. Other substitutions occur, too. The listener becomes so accustomed to hearing the dialect that it is accepted, yet it could possibly be a detriment to an individual in later years. It is hoped that the time will come when much more help can be offered to these children than is now given.

In some instances, children move to the community who have learned no English at all. Families often come from a foreign country to a university community. Such was the case of a little boy in the second grade who was from Indonesia. He spoke no English at all when he first came to this country. He comprehended a little English but no English was spoken at home. He had studied English at school before coming to this country and could read and comprehend written English fairly well. When spoken to in English, he reacted as a deaf child showing no expression or reaction in his face. A program was outlined for this child built around a naming vocabulary at first. Then two words were put together - naming something and telling what it does. It was necessary to use many pictures and actions. Children learning a new language show a great deal of shyness in trying it out and they must learn not to be afraid to hear themselves speaking in a way strange to them. The Indonesian child now is beginning to express himself in English though is not yet really fluent in the language.

Now let us turn to the procedures which may be followed in dealing with the kinds of language problems which are more often found in public schools. The child whose language skills are poor due to environmental deprivation needs to start building language in close relationship to himself. Thus we start with the parts of the body. A child may know that he has arms and hands, but he must learn to identify and name them and know what they can do. He then can learn how these parts relate to each other, when his hands are behind his back, on top of his head, etc. Learning items by categories helps build relationships: - the clothing he wears, the food he eats, his family, the house he lives in, pets, furniture, toys. Then we begin to expand the vocabulary as we broaden the environment, by reaching out further and further into the community. The child then begins to be aware of what is in the yard around the house, neighbors and other people he knows, the part, stores, public buildings, and all the many things associated with school.

Quite frequently, it is found that these children literally do not know one day from another. Learning to distinguish days and know the names of the days can be taught by the activities associated with certain days. For instance, which are school days? Which days do they stay at home? Which days do they stay at home? Which days do they go to church? Nor are they usually aware of the various seasons of the year and of weather changes. This is another part of the environment which you wish to build up: the sequence of time, what comes before, and what comes after, in time.

Objects and pictures are used to a great extent. Since we are building concepts as well as teaching words, everything has to be related. We cannot simply show the child a picture of a cow and teach him to say 'cow', he must learn what the cow does, how the cow helps him, etc. The speech correctionist must learn to think in terms of giving visual stimuli, auditory stimuli, giving time for integration to take place and he must learn to be alert to the kinds of *responses the child makes to these stimuli. An overt response may or may not occur, but you should not try to force the child to say something, although you do continue to stimulate him.*

Eventually, naming and talking will occur. Sometimes the child will seem to know things beyond those which you have taught. There seems to be a build-up and transfer into the child's using more language than you believe you are teaching. This is why it is so important to have an outline or a pattern to follow in your teaching. If you skip around hopefully and teach only what seems to fit at the time, you will not know where to go next, and you will not have a very adequate way of evaluating what the child has learned.

Another useful technique in teaching these children concepts is pantomime. For instance, pretend to talk on the telephone and ask the child to identify what you are doing. Then reverse the roles with the child choosing what he wishes to pretend.

In the language development program, objects, pictures and actions are used to a large extent. When we are first starting to build concepts, it is better to use a whole object. For instance, if a child does not know what a 'pan' is, it is better to use a real pan than a picture of a pan. Then he can feel it, see it, bang it, and hear it. The more senses we stimulate, the more ways the child has to learn. Story pictures are useful. These can be arranged in the way the child thinks they should go to tell us a story. Even though the story sequence seems obvious to us, many children see it differently and will have a different sense of order in mind than we have. Some children are unable to think of any order and simply arrange the pictures at random.

One problem which occurs frequently in a child with a language problem is that of a short auditory memory span. This child may not remember any of what he hears, he may remember a part of it, he may listen to a short sentence and repeat it in confused order. As an illustration, consider a first grade child with a language problem who also maintained a mild articulatory problem consisting of an /f/ for /th/ substitution, and weak /l/'s and /r/'s which seemed to be developing. This child was unable to converse. When asked a question, he replied in one or two word answers. When asked to repeat short sentences commonly used in the speech screening of kindergarten children, he was unable to remember more than two or three words. A short series of numbers given out of order was impossible for him. When shown large pictures with many objects and people, including a boy running with his dog, the child's verbal response was 'boy'. This child was left handed and the parents were attempting to change him to right handedness. The parents were finally convinced, in view of the other problems this child had, to let him choose his own handedness.

This child did not understand nor use prepositions. For example, when shown a picture in which a cat was under a chair, he would say 'cat'. When asked where the cat was, he would point to the cat. When asked to put a toy kitten under a chair, he would follow the directions correctly, but was unable to *verbally state where he had put the cat. It is important to know that this child had normal hearing, was not shy or uncooperative. He was able to relate very well. He was smiling and willing to cooperate, but after he had said one or two words he was unable to expand further.*

The speech correctionist worked with this child during the school year and lessons were continued during the summer at the University Speech and Hearing Clinic. The emphasis of the program was on auditory training, with a gradual increase in the amount of speech expected from him. As his listening, discrimination, recognition and memory began to improve, his verbal use of language improved. Although this child will probably always have some problem with auditory skills, his use and comprehension of language is much improved and he is showing more progress in the classroom. The parents were taught some simple speech activities which could be easily done at home which have also helped. The mother apparently was not really accustomed to talking with the child. She began telling the child the names of the objects she was using as she worked in the kitchen, she told him the words for various actions, described objects to him and generally gave him an abundance of auditory stimulation.

Although it was not possible to pinpoint the cause of this problem, it was possible to separate out the pathways for learning which seemed to be most affected. This child was not from a culturally deprived area, on the contrary his parents were both educated beyond high school. By patient and careful observation it is sometimes possible to devise therapy procedures for individual problems which do provide a more than adequate remedy for the child's learning deficiencies.

Stuttering:

Stuttering is a very difficult subject to discuss. There are endless problems involved. In any setting, this type of case is difficult to handle, but the school setting poses additional problems. A teacher may have a child in her classroom whom she considers a very severe stutterer. Perhaps the parents consider him a very severe stutterer and now the child himself is beginning to think so. However, he may have become used to the condition and may not want to worry about it. Since the stuttering does not bother the child especially, he may not want anyone bothering him about it. There are enough factors against working with this child that the speech correctionist might decide it would be better for the child not to put him on the schedule at that time, even though the parents and teacher might desire it. Sometimes the speech schedule is so crowded that the correctionist could take the child only enough to disrupt his school schedule and not really accomplish anything. Even if all factors were favorable, i.e., parents, teacher and child cooperative, if the correctionist did not have time for a complete program for the child, he might not respond in the way hoped for and everyone concerned would be left with a feeling of failure. Case selection is of utmost importance and all factors should be favorable toward improvement before taking the child for direct therapy. Several procedures are followed before we schedule any child with a fluency problem Actually taking the child in for direct therapy is one of the later steps in the process.

Stuttering varies from mild to severe. You have probably heard some very young children say 'b-b-b-but' with a slight repetition or mild repetitions on various sounds or words. We hear this occasionally, among kindergarten, first and second grade children. In more severe cases, a child may be blocked completely, unable to utter a word, even in repetition. In some of the upper grades you may find an older child who for one reason or another, or for many reasons, has developed what may be called secondary symptoms. He may have acquired some really bizarre patterns to help him get through his stuttering spasms. He may stomp his foot, may tighten up all over, blink his eyes, his head may jerk, or he may hit the table when he wants to break through the blocked word. There are a whole series of actions which he things may propel him through that stuttering block. We do not see very many conditions of that severity in the elementary school children. Perhaps with continued attempts to handle the problem intelligently, and with public education, the condition of stuttering will occur even less frequently and when it does, hopefully will be of a mild nature. Dr. Wendell Johnson has performed an outstanding service in educating the public to accept stuttering. This may be one of the reasons we do not seem to find many severe stutterers among children. There are certainly some, and you will see some as you work with school children.

With a mild condition, and maybe more severe, if a child is not aware of stuttering and does not seem to be worried about it, we do not make direct contact with the child. When the teacher gives us a referral slip, we discuss the problem with her, and secure all information possible. This type of therapy is often referred to as 'indirect'. We also confer with the parents and try to find out how the child is being helped at home, or how he has been handled at home. Recently, one case which worked out successfully was handled entirely on an indirect basis. The child was in the first grade and his speech was characterized by frequent repetitions. In conference with the parents it was found that they had been very rigid toward the child's behavior in all respects, including speech. The parents began to see that they were really expecting things of a first grade child that were beyond him. A lot of things came out in conferences which we could never have known about if we had not conferred with the parents, and they were all things which could be adjusted. The teacher, too, was cooperative and found better ways of handling the child in class. One of the finest things, and most helpful in this case, regarding counseling parents, is the 'Open Letter' that Dr. Johnson wrote to the parents of a stuttering child. It is written for the lay person and it explains so well how to handle these children, how to adjust attitudes and how to view the problem the children may present.

If we have pursued an indirect course, and it is successful, that is fine. We usually do not take the child into direct therapy until we are sure that all the conditions for making some kind of improvement are at least good. We do not want to take a child in the face of all odds. If the parents refuse to cooperate, if the teacher just does not have the time, if the child does not want to come, the approace to handling the problem will have to be worked out very gradually. If, however, all conditions seem to be favorable, the correctionist has decided to go ahead and work directly with the child, then the first step would be to help the child to understand himself to some extent. You cannot handle a child as you *would an adult. You cannot talk to him in the same way and you certainly cannot lecture him out of the situation. As a speech correctionist, you know that this child may have a fluency problem the rest of his life. There is no known cure for it. If his lack of fluency disappears, again you do not know whether it is due to something you have done, something in his environment, or perhaps a combination of several factors. The correctionist works with the idea of using the best information available so far as literature and research are concerned, but we have to re-evaluate as the therapy progresses and make judgements as to the value of the therapy.*

Usually, when we take a child for direct handling he will be exhibiting a more severe form of stuttering. He will be disturbed about it and want to do something about it. Your major goal at this time is to bring about a change in his attitude toward the way he talks. He must cease feeling embarrassed and chagrined each time he makes a mistake. He must learn that anyone has some dysfluency in speech at some time or other. One important concept which he must learn is that there is such a thing in the world as failure. In anything you do there is always a possibility that it will not come out right. One person who works very effectively with children who stutter has used an interesting analogy to demonstrate failure to the child. He conducts a play therapy session in which the child and the correctionist are working with clay. He shows the child a beautiful china pitcher and explains that they will now model a pitcher from clay. They do make a pitcher, but it is not perfect like the model. Then the correctionist explains that, even though the pitcher is not perfect, it could be glazed and fired, and you could pour liquids from it and it would be a very useful pitcher. Although it is not perfect, the important thing is that it can function for its intended use. The child failed to make a perfect pitcher and he can accept this failure as well as some other failures. Accepting failure applies to the correctionist too. We want good results with the child, but what was tried one time may not have worked. The thing tried next may have worked, but all the way through in stuttering therapy, there is a series of attempts and failure, and learning by the failure to do something better next time, but not quite reaching the goal, then going on to something else which may take the child a little further along. There is a purpose for each step, but trial and error are a part of the program.

When you are working with a child you have to establish a rapport with him. He must feel confidence in you and you have to feel condifent about working with him. In building this feeling, you can use some commercial games; checkers, a game called 'Sorry', one called 'Play It Right', which are a lot of fun for the child and serve as excellent tools in establishing the necessary comfortable feeling between child and correctionist. The games bring about a little conversation, the child is also more relaxed and sometimes his speech is more fluent. If he is more fluent, you do not immediately say, "See how well you are talking now". As soon as you point out his 'good' speech you make him feel that the rest of the time it is bad and the only time it is good is when you remark on it. If we emphasize the 'good' speech he will think that you expect it always to be that good and this can only increase his anxiety. Fluency must be approached in gradual steps. You want the child to help himself, but you do not expect him to arrive at fluency all at once.

The correctionist can approach a direct discussion of speech with the child by first talking about the speech mechanism. The articulators can be identified, the larynx, the breathing mechanism and their roles in speaking can be discussed, and the way in which the whole body is involved in speaking. In addition, the child has to be helped to understand the nature of the therapy; i.e., he must know what kinds of things he will be doing in speech class. It is very important that he learn to develop realistic personal goals for himself. When a child has been scheduled for direct therapy, he has probably reached a point at which he has become very sensitive about the fact that he has trouble with speech, but he is motivated to do something about the problem. The correctionist has helped him accept the fact that he stutters, and the child now feels that repeating and blocking in talking is not a catastrophe. Now that he can talk to people without acute embarrassment at each dysfluency, the correctionist will attempt to guide the child back to the point at which he was in his speaking before he reached the stage of embarrassment. It is hoped that the child no longer feels that stuttering is a serious failing, and he can become less sensitive about dysfluencies. During the entire therapy, the goal is aimed toward developing a healthy attitude toward working on speech, and toward speaking.

One of the reasons we are so reluctant about working in the public schools with children who stutter is that we want to avoid building up a negative attitude in the child toward his speech. It is necessary to be very aware of the time to terminate therapy. If the correctionist feels that negative attitudes are developing, then it is better to explain to the child at this time that he needs to spend the lesson time in the classroom rather than coming to speech class. The speech correctionist must be aware that if he attempts to fight through too much resistance, he may cause the child to become bitterly discouraged so that he may never be able to benefit from therapy.

If the correctionist feels that things are going well and the child is making some progress in attitudes, even if the stuttering does not cease, the correctionist will have helped in building healthy attitudes toward facing and performing difficult tasks as the child grows older. Gradually, but not suddenly, the child must learn that he will probably always have some dysfluencies in his speech. That is when the correctionist can point out that other people have these, too. It is helpful sometimes to talk about outstanding or famous persons who stutter, as the actor, Jimmy Stewart, who have become successful in spite of their speech. They have learned to accept themselves and the way they talk. They know they can do certain things well, and speech is not allowed to be a problem. It does help children to know that some amount of dysfluency will not prevent being successful in other ways.

As the correctionist works more and more into desensitizing the child, the problem is being brought into the open. It is faced mater-of-factly. The child learns to become objective and can talk about what he does when he stutters. He learns to look at himself as if he were seomone else, and becomes aware of what mannerisms he uses when he blocks on certain words. These are words which he tries to avoid. He learns to become analytical about his speech and to *discover which sounds he gets 'stuck' on, and how he tries to get out of these blocks. As he learns to recognize all the bizarre actions he has acquired which really do not help him overcome his blocks, one by one he learns to eliminate them.*

One technique which is sometimes helpful is to study each consonant sound and show the child how he can say each sound with a very light contact. In the first attempts, he may make the sounds too hard or even block on some of them, but he learns to do it more and more lightly until he is barely making the contact for the sound. Another technique, which Van Riper suggests, is called 'cancellation'. In this, the subject has a full block and this is a relief to him. He gets the word out finally, then the correctionist asks the subject to pause, then go back and face the word again, this time blocking purposely, but less severely, which 'cancels' the first severe block. Then he continues talking until another block occurs, at which time he repeats the cancellation process.

Another technique often used is called 'pulling out'. In this the subject blocks, then gradually releases the amount of tension being used on the block, all under control. The subject is using a normal speech process instead of some unrelated activity such as pounding or stamping or blinking.

In the later stages of therapy, the speech correctionist will assign speech situations for the child outside of class. Perhaps there is a particular situation which is always difficult for him; for instance, when he goes to the barber shop, that may be the one time he cannot say how he wants his hair cut. The correctionist and the subject practice these difficult situations and he learns how to apply his techniques to make the situations easier for him. It is easy to rehearse without difficulty, but when the subject is in the true situation his carefully learned techniques at first may desert him. With continued practice he does learn better how to use the techniques in public.

It is a tremendous help for the child to have a classroom teacher who can understand what you are teaching the child. It is important for the correctionist to keep her informed about what stage of therapy the child is in and how she might expect him to react and what things she might expect him to be able to do. Perhaps at first the correctionist would not want her to call on the child at all in class, but later on increase the amount of his oral recitation. The correctionist might talk with her about decreasing classroom pressures. Having an interested, understanding and cooperative classroom teacher to work with is one of the advantages of working with the stuttering child in the public schools. Basically, it is necessary to have parent cooperation, but teacher cooperation provides a very important source of help in the child's environment.

There are many other techniques for stuttering therapy which are not discussed here. Some will work better with one child than with another. Not all techniques are used with each case - the therapy must be tailored to fit the particular child; however, the procedures considered here should provide a general overview of the type of approach you might expect to find as you observe these children at school.

Voice Disorders:

This discussion of voice disorders will be limited to those classified as 'functional' disorders. Functional voice disorders are those in which no condition is present to the extent that it is not possible for the voice made to function 'normally'. The larynx is intact and it is possible for the vocal folds to act. There may be some physical condition which has affected the function of the vocal folds and this may have to be alleviated before the voice can function correctly, but basically it should be possible for the true voice to be produced by use of some proper type of therapy.

Before actual therapy is begun with any type of voice disorder, the child is referred to his physician for a physical examination and specifically to diagnose any physical condition which may cause the abnormal voice condition. It is most helpful if an otolaryngologist can see the child and check the actual function of the larynx and associated areas to evaluate the problem. If there is no medical or surgical treatment for the condition, the physician may recommend voice therapy and the speech correctionist can proceed from there.

Voice disorders can be divided into three general categories; pitch, loudness and quality. A disorder of 'pitch' indicates that the child's voice may be pitched too high, or it may be pitched too low as related to his age. The term 'loudness' also means just what it says, a voice that is too loud or too soft. If a child's voice is too loud, other vocal problems can result. Children who habitually yell and irritate the vocal folds may eventually be able to speak only in a hoarse voice, and the problem then becomes one of quality. A child who talks too softly is difficult to hear in the classroom and we are often sent referrals from teachers when the problem is that of the child speaking so softly the teacher cannot hear him. Usually the teacher is given some suggestions for helping the child in the classroom rather than placing him on the speech schedule, unless the problem is very severe. It is sometimes helpful for the speech correctionist to go into the classroom and demonstrate some techniques for increasing loudness. One technique is to ask a child to come to the front of the room and say something very softly. Then the speech correctionists asks who can hear in the back of the classroom what was said; no one can, of course. Then the child gradually increases loudness until he can be heard easily. The classroom teacher can continue with some other exercises for the class.

The third category of voice disorders is that of 'quality'. This category can be divided into types, resonance problems and problems directly involving the larynx. If a child has too much resonance, his voice will sound too nasal. The usual term for this condition is 'hypernasality'. If there is too little resonance, the child will talk as though his nostrils are pinched, or as if he has a bad head cold. This condition is referred to usually as 'denasality'. A hypernasal condition can occur following removal of enlarged tonsils and adenoids, denasal quality is often present when the adenoids are very enlarged. Nasal polyps, allergies and other conditions can cause this type of quality also. An example of therapy procedures with denasal quality is that of a third grade *boy whose speech was denasal to the point that his speech was extremely difficult to understand. The child was taken to an ear, nose, and throat specialist for examination, and it was found that in addition to a mildly allergic condition, this boy had never learned to blow his nose properly. His sinus and nasal passages were so impacted that resonance was not possible and he could only breathe through his mouth. After the sinuses were drained, the doctor treated the condition with nose drops and instruction on properly blowing the nose. One would think that the child's speech would immediately sound all right, but this was not the case. The child had to be taught through articulatory drills, how to produce the /m/, /n/, and /nk, and /ng/ sounds.*

Quality problems involving the larynx are 'breathiness' and 'hoarseness'. The child who habitually speaks in a breathy voice simply may have to learn to increase the tension until a real voice occurs. A child who shouts constantly when playing and even in talking, may develop a hoarse voice. One of the first techniques attempted is to put the child on 'vocal rest' which is indeed difficult to enforce. These children yell without knowing that they are yelling on the playground. The teacher can control this in the classroom and the parents can control it somewhat at home, but the part of the child's time spent beyond adult supervision is hard to control unless the child is highly motivated.

Each child has to be handled individually and on the basis of what his problem is in any type of speech correction. There is a great deal of difference in dealing with a child with a hypernasality problem and one with a denasality problem; a difference in dealing with breathiness and with hoarseness. The exact techniques used will vary with the disorder. The major goal in all types of voice disorders, of course, is to bring a voice that is not acceptable into an acceptable range. Just as in articulation therapy, the child must learn that the way he speaks is different from the way most others speak; so there is a kind of ear training procedure in which you go through steps of identifying the difference in his voice from the standard. He can listen to other children and compare his voice to other voices. He must learn to recognize how his voice should sound so he will know his goal.

Whatever the type of voice problem, the child must first learn to produce the voice which is correct for him. Once he has done this, he can practice sustaining vowels until he hears that he can hold a vowel and make it sound clear for a setment of time and then be able to repeat it consistently. After he sustains vowel sounds in the new voice, he must go ahead and learn, just as in articulation therapy, how to use this voice in syllables, words, sentences, and in connected speech. Eventually the child must be able to use his voice in a structured, then in an unstructured situation in the carry-over work. Many of the materials and devices would be the same as those used in articulation therapy. The child would be given assignments for carry-over in the classroom and at home.

Some types of voice disorders are very difficult to handle, particularly those involving laryngeal problems. If the correctionist does not achieve some *degree of success, within a few weeks of therapy it is sometimes best to discontinue the lessons. Some writers feel that it is wiser not to work with young children with voice problems, because calling attention to the deviation may cause anxiety without the correctionist bringing about a favorable change. Also, the restrictions and requirements of therapy are very difficult for young children. Although there are a large number of voice deviations found in the public schools, the number of children actually taken for therapy is very small. One of the chief services the speech correctionist can render is to identify the problem and refer the child for medical diagnosis, thus possibly preventing the development of an even more serious condition.*

The Hearing Mechanism

Jack Willeford, Ph.D.

I will talk about the ear this morning, There are so few of you I think we can be rather informal as we talk about anatomy. I will talk a bit about the ear first before we get into specific anatomy and I am going to have you look in each other's ears so that you will know first hand the kind of thing we are talking about. You have probably observed ears in the mirror many times and you have no doubt seen unusal appendages on certain people. We are going to take a close look at the ear this morning. So often the things that you eventually study sometime in life are things you very frequently have just taken for granted. You pay a casual passing interest in it, but when you stop to look at it, it gives you a new appreciation.

The ear is extremely important to us because our speech and language develop through the auditory process; and this is something we all surely grow up with; we raise our own children assuming that they are going to have normal speech and language, and it usually turns out that they have. We do not stop to offer thanks to anyone until we recognize some child that is born without hearing, or loses hearing early in life - a deaf youngster particularly, as opposed to one with a minimal impairment - then we suddenly become very interested in what a fascinating mechanism the ear is - what it can do for us, how it can enrich the mind and keep us in the company of man, as Helen Keller once said.

What is this thing that we call the ear? It is an extremely delicate instrument, highly sensitive, and has magnificant efficiency when you study it in detail. It puts most machines to shame in terms of its design and in operation, even in this space age. For example, the ear is so sensitive you can almost hear the random collision of molecules of air bouncing against the ear drum. In a sufficiently quiet room this is essentially the case for some people. On the other hand, the ear can withstand sounds that are strong enough to set the entire body in vibration. Think, then, of the tremendous dynamic range of just the sensitivity of the ear - from a threshold of hearing molecules bouncing around in favorable environments to tremendously powerful sound waves that can actually set the body into motion. When you are exposed to sounds which are too loud, the ear becomes damaged, but it is not destroyed. The damage is rather selective.

I think one of the most fascinating things about the ear is its tremendous selectivity, if we can call it that - the way in which you can use hearing when it is normal. One of the interesting examples is frequently referred to in the profession as the 'cocktail party effect' or the cocktail party phenomena. Most of us are familiar with this kind of thing whether it is actually a cocktail party, a PTA meeting as they break up for coffee, or whatever the occasion. What it *implies is a situation where a group of people are all talking at one time; a number of conversations are going on and I like to think, as the best example, of some of our national conventions - where people get together and are "just shooting the breeze" - where many conversations are going at one time. It is interesting when you stop to think about it, how at a party, or standing in the lobby of a hotel talking to a friend, you hear something interesting going on behind you - a name dropped, a term, and you just tune the person out you are listening to. You stand there nodding as he is talking, but you are listening to the conversation behind you. You have this kind of selectivity. You can tune in and out and know what is going on around you rather well by virtue of having balanced hearing in your two ears. This is something we do not normally appreciate. Another example would be the fact that fathers can sleep through the night very nicely but mothers hear a baby's cry almost instantly. Yet I suspect that when the house is on fire father would hear the crackle of flames probably before anyone else; so there is a sense of training and conditioning associated with this selectivity - but the implication here is that hearing really is operative all the time. We do not turn it off like we do vision; we turn the brain off, so to speak. At night we close our eyes, but the ears are always open. They are always ready to operate.*

One other example, I think, would be the conductor of an orchestra, or a choir director, who can detect a flat note where many people cannot. Or he can tune his hearing selectively to listen to a specific instrument or group of instruments; to a specific section of the choir, the sopranos, the tenors, and so on; and as it were, tune the others out for a moment. Ramsdell talks about various psychological levels of hearing too. This is old information, but it is always appropriate. He states that we have three levels of hearing. One is the primitive or background level - that is, a level which essentially keeps us in touch with the world of sound. It simply involves awareness of background, on-going noise. Then he notes a second level which he refers to as the warning level or the signal level. This is the level at which, if you were walking across the street in a reasonably noisy environment downtown, and a car honked, you recognize the approaching car even though you may be engaged in a conversation. Finally, he mentions the social level or the foreground level; perhaps a better term is the symbolic level. This is the level at which we communicate. This is the level to which you are attending right now as you listen to me. If you want to tune in the primitive level, you can; at the moment you can listen to the air conditioning system in the background, but unless your attention is called to it, you pay no attention to it.

Bekesy has emphasized that the structure of the ear is extremely delicate as indicated by the minuteness of the vibrations to which it responds. At some frequencies the vibrations are about as small as one billionth of a centimeter almost, or incomprehensible in size. This is about one-tenth the diameter of a hydrogen atom: pretty insignificant movement, is it not? Interestingly, these are the vibrations which eventually move the tiny membranes, that we will look at after a bit, in the inner ear. The movements of the sensory mechanism of the ear - which then transmits this stimulation on to the brain - are 100 times smaller than the kind of activity that is taking place at the eardrum. This fact alone is probably one of the reasons why we still have such inadequate knowledge *of the physiology of the ear. Although we are learning a great deal that is new in recent years, there is still an extremely large void of knowledge about the ear and about hearing. For example, we still do not know exactly how these vibrations stimulate the nerve endings. There are a number of theories, but I suspect that through some of the excellent electrical-acoustical refinements today in instrumentation, etc, that we will continue to learn. Research has certainly made a good deal of new learning possible, just very recently.*

The ear has fantastic abilities as I have implied. We have some rather practical ones, too, that we as audiologists are particularly aware of and consider to be very important. How many of you have ever had a hearing test? (Two of you.) I will be talking a bit about this - using some terms like frequency which is the physical term for the attribute of pitch. So when I use that term this morning I will really be talking about pitch for the highness or lowness of a sound. We normally measure hearing for pure-tones (as I think Dr. Sweetman is going to talk about) and record the responses on an audiogram. We measure sounds from 125 double vibrations or cycles (Hertz) per second up to 8,000. That is considered the practical human range - although as you will see, we can hear beyond those ranges. For practical purposes this is where we concentrate our efforts of measurement; we have the subject listen to these tones, taking samples at each of these frequency areas. We also have tests using speech material and quite a variety of other tests that you may learn about in this lecture series. Tests are made of the ear's sensitivity to different tasks; specific auditory tasks that challenge one to respond in a certain way. I think, after you have listened to these lectures, you will have a reinforced appreciation for the selectivity of the human ear.

The ear is least sensitive for low frequency sounds. The sensitivity of the ear for a 100 hz tone is 1,000 times less than that for 1,000 Hz. Reading horizontally across the audiogram, we have 125, 250, 500, 1000,2000,4000, and 8000 Hz. Those are the standard frequencies we measure. The difference from 100 to 1000 Hz does not seem very great in terms of subjective pitch - but it seems that this comparative insensitivity to the slower vibrations of energy, which is what sound essentially is, is a physical necessity. If this were not true we would hear all of the vibrations of our own bodies, our muscular contractions, etc. Some people claim to be able to do this anyway, when they close off their ears with their fingers in a quiet sound environment. It is interesting that the stethoscope measures extremely low sounds which may be a very limiting factor of the fact that the ear is insensitive to low sounds, because sounds heard from inside the body are essentially low frequency sounds from 750 Hz and below.

Bekesy has stated that if the ear were any more sensitive at low frequencies, we would probably find ourselves disturbed by body noises. The noise of the head simply bouncing on the body as we walk would be disturbing. There is another angle to this too. That is that low frequencies tend to mask high frequencies. Therefore, if we had greater sensitivity at the low frequencies we would find a good deal of interference with what we chose to hear. The most common estimates of the range of sensitivity to frequency is from 20 to 20,000 Hz.

However, some hearing is possible as low as 8 to 10 Hz (Bekesy says 1 Hz) and some people claim they can hear as high as 40,000 Hz. This extreme range is true only for young, normal-hearing, adults, and drops steadily with advancing age for most people.

Bekesy did what I think is a fairly depressing experiment a few years ago. He presented tones of fixed intensity to a group of people in their 40's over a period of about five years and found that the upper limits of hearing drop about 80 Hz every 6 months. If you could generalize this result to everyone, you could on the basis of life expectancy, predict what your hearing is going to be over a period of years. However, we know that there is considerable variability to the ageing ear. Some people begin losing hearing very early and some do not until quite a bit later. I think it helps to explain the common phenomenon of simple ageing by realizing that we begin losing elasticity of tissues, and this happens in the ear as it does with skin and other tissues in the body, so that over a period of time our hearing does begin to become less sensitive.

I will skip over discussion of how sounds get through the ear with the simple explanation that, again, the ear is a rather remarkable organism that can take sound energy arriving at the ear drum and transmit it through a chain of bones into fluid in the inner ear (wherin lies the sensory mechanism for audition) essentially without losing sensitivity. In changing the mediums of energy transmission from air to fluid, normally there is a good deal of reflection which probably would be encouraging news to fishermen - many people think that if you make too much noise around someone who is fishing you are going to scare the fish away. This is not too likely to happen because most of the airborne sound energy would be reflected off the water and very little of it would be able to penetrate. The ear is designed with its transformer system of three little bones that permits a reduction of the amplitude of activity, but an increase in the force of it a kind of step-down transformer system that maintains the fidelity of the input sound - very little of it is reflected back and there is very little loss. This is another of the remarkable aspects of the ear, rather formidable mechanical and physical problem which nature has overcome very nicely.

I hope this bit of introduction gives you an appreciation for what a truly remarkable organ the hearing mechanism is and will, perhaps, help to create greater interest and motivation as we start talking about anatomy which, to some people, is not a very exciting subject. Personally, I am fascinated by it, but I think this kind of background may give you an appreciation for the specific kinds of structures we are going to be talking about.

As we discuss anatomy I think it is most convenient to start from the outside and work in. This is also a logical order. Let us look at the ear in its over-all view first and we will keep coming back to this view in an effort to achieve the proper perspective for you and keep you oriented. The appendage - the part we can all see is called the pinna or the auricle. Sound waves enter this appendage and go down the ear canal (which is referred to as the external auditory meatus). They strike the ear drum which, more technically, is called the tympanic membrane. This part, so far, constitutes what we call the outer ear, one of the three major divisions of the ear. This tympanic membrane is the terminal point of the external ear and the beginning of the middle ear. The middle ear is referred to frequently as the tympanic cavity. You may be working with people who use the technical terms as opposed to the lay terms, so I will give you both.

In the tympanic cavity you see the three tiny bones I spoke about and which most of you are probably familiar with; you have heard about them in elementary school, or have had some introduction to them somewhere. They are known as the stirrup, the anvil, and the hammer. We have other names for them also; the stirrup is called the stapes; the hammer is called the malleus; and the incus is also known as the anvil. These bones incidently are known as the ossicles or are referred to as the ossicular chain.

I want you to note particularly the size of the stapes. The minuteness of the tiny stapes and the way it works should give you a better appreciation of the ear that we tend to take for granted; you begin to recognize what an amazing mechanism the ear really is.

Another part of the middle ear is a process that most of you are familiar with also; that is the Eustachian tube which connects the ear with the nasopharynx, the back of the throat. It is a very simple process for the common cold to settle in the ears because of the direct connection through this tube. The Eustachian tube also helps us to maintain an equal balance of pressure (barometric pressure) on each side of the ear drum; some of you have had the experience of going up or down mountains, or in an airplane, and feeling the pressure changes in your ears. In both instances it is because of the rapid changes in barometric pressures. The final stage in the communication systems of the ear is the inner ear which faces on a bony wall forming the innermost side of the middle ear.

There are two windows in this wall. One is called the oval window, the other is the round window. The chambers of the inner ear house the sensory mechanisms for audition and for balance, the tiny circular canals above and the cochlea below. The cochlea is the sensory mechanism, the end organ, for audition - but associated with it in the inner ear is the vestibular mechanism which involves the three semi-circular canals which serve us in space orientation or balance. These two mechanisms are connected to the brain by the VIIIth cranial nerve. The cochlea analyzes complex sounds such as speech and the VIIIth nerve transmits these signals to the brain for interpretation. Our discussion thus far represents grossly the complete ear mechanism; the outer ear, the middle ear, and the inner ear.

Let us begin again with the pinna and during the remaining time look at some of the specific aspects of anatomy which are associated with the hearing mechanism. As I go along I will try to hit the high points for you - those which I think may have practical implications for you, as opposed to isolated terms that you probably will never hear about or have occasion to use.

Let us again look at the auricle. I think it will be helpful as we talk about this if each of you will examine your own with your fingers and see if you can identify some of the landmarks, particularly the helix. The helix is the area that constitutes the rounded outer portion. The recess just under the helix is known as the scaphoid fossa. The hard rigid prominence running parallel to the fossa is the anti-helix. The hollow area right in the center of the pinna, just before you enter the ear canal, is known as the concha. The lowest soft portion of the pinna is the the lobule, and it serves very well those women who wear ear rings. This portion of the ear is well-designed to hold ear molds in place; if we did not have them we would have to devise something quite different to accomodate hearing aids.

The pinna is felt by some people to play a fairly important role in the localization of sound - to assist in identifying where sound is coming from - to help provide us with some orientation to our world of audition. It is rather inflexible in most of us as opposed to animals who can turn their ears and zero in on the source of sound to enhance the auditory process.

The pinna has some sort of cosmetic appeal (we would look strange without them) despite its rather peculiar appearance. It is primarily of cartilaginous material and is covered with skin; the only part with other types of tissue is the fatty lobule which is soft.

In general, the size of the pinna seems to be related to the relative biological importance to the animal. For example, bats have ears which are designed to receive particularly high frequency sounds.

Let us now consider the ear canal. The external auditory meatus of the canal is about one inch long and about one-fourth inch in diameter. It varies some in size between individuals - particularly the diameter. You may have noticed certain people with canals larger than others. It runs slightly forward in the ear. It is wider at the concha, narrows where the cartilaginous meets the bony portion which constitutes the inner two thirds. It gets wider again and then finally narrower as it approaches the ear drum. This latter stage, the narrowest point, is called the isthmus. In the canal we find cerumenous glands which produce the brown wax that we are all familiar with. It also has hair and sabbacious glands. These serve the purpose of lubricating the skin, and they also serve to prevent foreign articles from getting into the ear. The wax is being produced constantly, and it is quite normal for the average person on occasion to have the excessive wax roll out of the ear in a little ball. At times it may need to be removed.

The malleolar stria is the projection seen in the membrane as you look through the otoscope. It is simply an outline of the handle of the malleus where it has its attachment to the tympanic membrane. The upper portion of the generally taut tympanic membrane is a more flaccid or loose portion known as Shrapnell's membrane. The entire membrane fits into a recess or ring called the tympanic sulcus. The purpose of Shrapnell's membrane is to accomodate sudden pressure changes such as with slamming doors without altering hearing substantially.

There are three layers of tissue running through the tympanic membrane. One layer folds around the handle of the malleus to provide attachment to the membrane. Also in these layers is a part of the facial nerve known as the chorda tympani which is fairly easily damaged. Certain pathological influences on the ear may affect the facial nerve in some people. It usually results in impairment of the gustatory sense so that a problem with taste occurs and leads many people to the otologist or to their family physician.

I will identify for you very briefly the three layers of tissue in the typmanic membrane: 1) the outer layer is cutaneous; it is a thin layer of skin, 2) the second layer is tendonous, which has two types of fibers - some running radially from the center out to the perimeter like the spokes in a wagon wheel, and some circular-type fibers. This structuring lends strength to the membrane because it has to withstand a good deal of pressure both from sound and from water and other foreign objects that may get into the ear. 3) the innermost layer is simply a mucous membrane which is constituted of a single layer of cells. The handle of the malleus fits between the middle layer and the innermost layer. In this manner it is bound to, and articulates with, the typmanic membrane.

Let us examine the tympanic cavity now and take a look at what happens on the back side of the eardrum as we visualize it. This is a fairly small space in the skull. The entire tympanic cavity is about a half inch high and somewhere between 1/12 and 1/4 inch wide - so we are talking about an extremely small area which houses the ossicles plus the muscles which control them, and the ligaments which hold them in place. The lateral wall is almost exclussively part of the tympanic membrane. The head of the malleus projects up into a free space where it can operate freely when the drum membrane vibrates. This is called the epitypmanic recess; it is simply a space provided so that there can be reasonably free movement of the ossicles which enhances the transmission of sound.

Tunneling back and away from the epitympanic recess, back into the mastoid processes, is a space known as the antrum. The roof or the ceiling of the tympanic cavity is known as the tegmen. The front wall houses the oriface or the opening for the Eustachian tube coming into the middle ear; and the medial wall is almost exclusively a bony wall that contains the two windows - the oval window where the stirrup fits into and the round window below that. And running across the medial and back wall is the facial ridge which is simply a supporting cavity for the facial nerve.

Let us move along now to the inner ear. The membraneous labyrinth fits inside of a bony labyrinth in the inner ear. I think one of the most difficult concepts to grasp is the fact that the bony labyrinth itself is just a space. It is not something you can take out and examine.

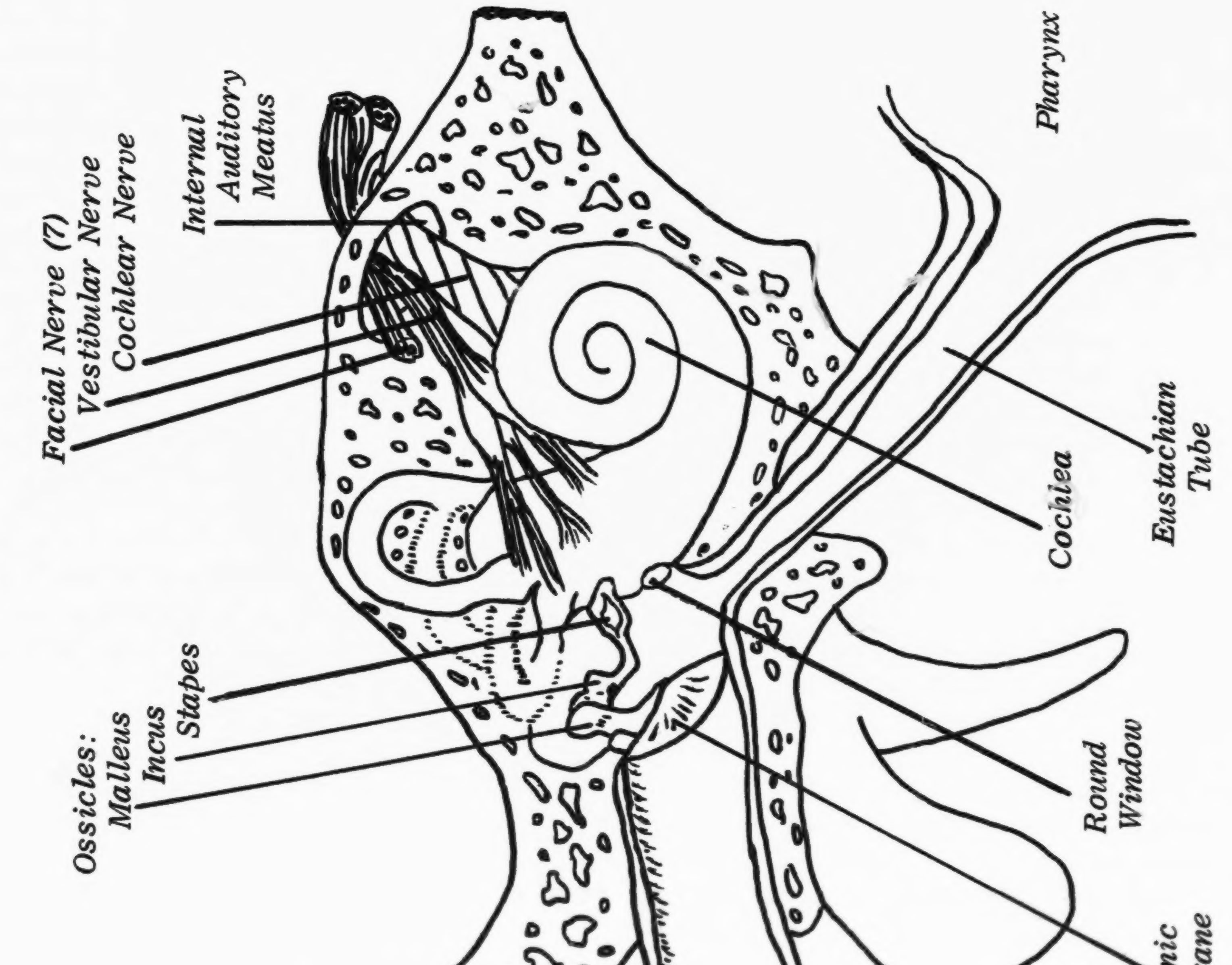
When sound hits the tympanic membrane, the stapes begins to move in the oval window and sets up a movement in the fluid with which the inner ear is filled. There are two types of fluid - the fluid that fills the bony labyrinth and in which floats the membraneous labyrinth, and a fluid of different chemical content which is contained inside of the membraneous labyrinth. Movement of *the stapes creates movement in the outer fluid (called the perilymph), and that movement then impinges on the walls of the membraneous labyrinth. The pressure of that fluid then pushes down on a little membrane going across and that sets up comparable activity in the inner fluid. The input pressure is ultimately relieved by the membraneous round window. The key to the whole operation is the fact that the organ of corti in the cochlea, the sensory mechanism for audition, lies inside of the membraneous labyrinth and along its entire length. There is a series of hairs; below these are hair cells and it is the movement of the pressure waves moving through the membraneous labyrinth that sets these tiny hair cells into motion and creates activity in the organ of Corti. The hair cells have direct connections to the hearing nerve. The auditory nerve enters the cochlea and at various points connects to these tiny hair cells. The movement in the cochlea creates a kind of bending action on the hair cells, since the pivotal point of the organ of corti is different from that of the overhanging tectorial membrane. In turn, they send impulses along the auditory nerve, through the brain stem, and eventually to the cortex.*

This explanation may be helpful in giving you an idea of the kind of activity that takes place when sound is created. Movement in the ossicles sets up pressure waves which, depending on their frequency (pitch) create major stimulation at some portion of the basal membrane; for higher pitches it is near the windows; the lower pitches have their representation as you go higher in this snail-like structure.

Let us carry this process to its final stages. The tiny hair cells appear to be embedded in the tectorial membrane (most people think they are). But the nerve endings are attached to the hair cells and they then proceed to an area called the spiral ganglia which is a clump of cell bodies - then the trunk of fibers enters the brain stem. This process actually happens on both sides; remember, we have two ears. There are a number of way stations from the cochlea nuclei, of which there are two on either side - a dorsal and a ventral - through the superior olives. However, there are certain tracts that cross over to the other side while others go up the near side. The next major way-station is the inferior coliculus, followed by the medial geniculate body. Finally fibers go to the auditory area of the cortex which lies right along there. This process is far more complex that I have just described. But we do know now that there are a number of other activities occuring in the total process.

One has to do with efferent fibers coming back to the cochlea. Another is the action of the reticular formation. We know now that both play an important role in audition. You can see that a rather complex chain of events occurs from the time sound waves strike the ear drum, set it in motion, are transmitted through the middle-ear chain (essentially without loss in sensitivity or reflection of sound), are then converted to fluid energy waves, and finally to electrical-chemical activity. All the while, fidelity of the original acoustic vibration is maintained as it is transmitted through a complex series of events to the auditory area of the cortex and sound is reacted to at that point.

It is believed that simple sounds (like tones) are mediated at the brain stem level, but that any complex stiumuls (such as speech) has to go to the brain for interpretation.


Facial Nerve (7)
Vestibular Nerve
Cochlear Nerve
Internal Auditory Meatus
Pharynx
Cochlea
Eustachian Tube
Round Window
Tymbanic Membrane
Ossicles:
Malleus
Incus
Stapes
External Auditory Meatus
Pinna

Schematic of the Ear

Hearing Disorders

Richard H. Sweetman, Ph.D.

Dr. Willeford introduced us to the amazingly complex structures and workings of the human auditory mechanism. It is now our task to discuss some of the things which can go wrong with this system. Of necessity, this will be a medical discussion to some degree. Now, you may ask, "Why? We are not M.D. 's and we cannot become M.D. 's. Diagnoses are up to the medical profession, are they not?"

In answer, I must agree. In fact, it is my strong belief that even we who have degrees in audiology must be very careful not to make medical diagnoses - to toss around specific names of pathologies when we can back them up only by audiological data. Certainly, you as speech aides will not be expected to glibly employ names of pathologies or actually label given problems with given specific names. Nevertheless, I think there is a very good reason why we should discuss something of what can go wrong with the ear. You must know more than is included in an old pediatrician's maxim. "When a child cries long without apparent cause, or if there is fever of undetermined etiology, think of the ears!" You will be working with people who have complex problems, and what you do with them will be very important. It is my contention that knowing something of what is going on in these children will help you to know what you are doing and will allow you to do a better job than if you are forced to work with something about which you are totally ignorant. Thus, even though I do not expect to make M.D. 's out of you by the end of the hour, we shall discuss this admittedly medical subject of hearing disorders.

We are going to have to be rather selective, however. You know that an M.D. goes to college for at least eight years before he begins to specialize, and then he goes on for two or three more years specializing in narrow areas. The physician who specializes primarily in problems of the ears is called an otologist. If a doctor has a bit wider range of interest, though, and specializes in the ear, nose, and throat region, he is called an otolaryngologist. We have somewhat less than eight to twelve years to cover this material, so you can see that we must be highly selective. Therefore, I shall limit myself to the hearing difficulties which you might be expected to encounter in the school situation.

We shall begin with the obvious, and that is before birth. We are all aware that some children are not born without physical problems. If we stop to think about it, though, it is remarkable that the vast majority of babies are born as healthy as they are. The new-born infant is not truly new in any sense of the word, however. Preceding birth he has survived an amazing nine months, a period beset by a multitude of pressures which exert a profound influence on him. Many of these pressures are controlled by genes, the carriers of hereditary traits. Some of these genes are responsible for the developing ear, so it *is easy to see that when these genes are defective, so can be the ear which comes of them. There is another important set of pressures which are imposed on the developing baby, and these are in the form of the mother's physical condition during the critical early months of pregnancy. If she is ill or takes certain drugs at these times, the developing unborn child can easily be affected. It is these pressures, those carried by genes and those determined by the mother's condition, which determine whether or not a baby is born with or without certain abnormalities. These defects might be connected with any complex of the human body. We are not, however, going to be interested in most of those; we will pay most attention to what might go wrong with the hearing mechanism.*

The severity of congenital hearing difficulties is dependent to a large degree upon the time of breakdown of the embryological developmental process. In general, the earlier the difficulty occurs, the more severe will be the problem. For instance, if the development of the conductive mechanism is impaired one and one-half months after conception, there is a good possibility that this whole system will be in bad shape. This is the case because developmental abnormality is occurring prior to anything being formed very completely. If, on the other hand, the involvement to this mechanism is limited to six and one-half months after conception, probably only the external auditory meatus will be involved. This is true because by this time nearly all conductive structures are developed completely. The cochlea, on the other hand, is nearly completed by the end of the third month after conception; it is for this reason we hear that this structure is vulnerable primarily during the first trimester of pregnancy.

As suggested earlier, the middle ear can be involved to various degrees depending upon the time at which its development becomes arrested. As Dr. Willeford mentioned, this is an area in which surgeons have tremendous success improving surgically. Otological surgeons can, if need be, drill an external auditory meatus out of solid bone and replace malformed or absent ossicles with man-made substitutes. It is truly amazing what can be done with congenital or acquired difficulties of the conductive mechanism.

One of the things which I am sure you all have heard about is the possibility for various problems to arise in a child if the mother has contracted German measles in the first three months of pregnancy. One of the things that can happen as a result of this problem is for the child to be born with a severe sensori-neural hearing loss; cells in his cochlea have been involved and they just do not develop normally. If a mother takes certain drugs, ototoxic they are called, at critical times during pregnancy, this too can lead to difficulty in the hearing mechanism. Large doses of quinine can be responsible for this. And sometime ago we all heard about thalidomine; some of the children who were born with congenital difficulties had congenital hearing problems as well, probably due to thalidomine. You realize, I hope, that these congenital sensori-neural hearing losses can run the gamut of severity. They can be a tiny notch in the ability to hear high frequencies, or they can completely eliminate hearing in one ear, or they can be responsible for a profound loss in both ears. Unfortunately, otologists can do little for these persons. The abnormal cochlea has not as yet been proved to be responsive to medications, and the system is so small and compact that it certainly is not amenable to modern day surgical procedures.

Let us now move on to acquired difficulties of the external ear. They occur in the portion of the auditory mechanism which is prior to the ear drum and middle ear. One of the things which sometimes occurs in this area is an infection of the skin lining the external auditory meatus. Technically, the condition is known as external otitis media. It does not interfere with hearing very much, but it can cause a lot of grief and pain to the person who suffers from it. This, obviously, is a condition which can be treated and cured by the medical profession.

Another difficulty often found in children is presently sung about! Humorous as the song, "Beans in Your Ears," may be, people do get foreign objects, from beans to bugs to pencil erasers, lodged in their external auditory canals. I have even heard of a child who had a ball bearing stuck in his ear! These items do not help hearing, particularly if they plug up the external auditory meatus or rest against the ear drum, and they should not be left unattended. Treatment is obvious: removal of the object (s) by medical personnel.

Some individuals are prone to the accumulation of wax (cerumen) in their ears. Instead of sloughing off and exiting via the canal as it does for most of us, the wax can accumulate and build itself into a ball. It can form against the tympanic membrane, which will impede its motion. Or, if it is allowed to go long enough, it can clog up the entire external meatus; this obviously will impede the entrance of sound energy into the ear, and the person will suffer from a mild hearing loss. The treatment for this problem is, of course, removal. Doctors usually first soften the wax; then they probe and pick with a long narrow tool to remove it.

The final difficulty which we shall discuss in the acquired external ear category is the ruptured ear drum. A ruptured ear drum obviously refers to a hole in the tympanic membrane. You logically would think that a ruptured drum would cause a real problem with hearing. Oftentimes, it does lead to a significant hearing loss, but surprisingly there are times when a person has an observable rupture in an ear drum and it is difficult to measure in terms of hearing loss. The degree of hearing impairment seems to depend in large part on the location of the hole, as well as its size. In addition to any hearing loss which a ruptured drum might cause, even more important, I feel, is the fact that as long as a hole is left in an ear drum, it provides an excellent avenue for infection to get into the middle ear cavity (which, you will recall, is separated from the brain by a bony roof which is less than one millimeter thick in some places). For this reason, it is very important that the ruptured ear drum be treated. Doctors do many things to alleviate the problem. Surprisingly, one form of treatment consists of irritating the edges of the hole with acid in an attempt to make them raw and activated to grow together. Some doctors place moistened cigarette paper over the hole. I was discussing this with one of my classes when a student informed me that her father was an M.D.; he closes off the tear in the drum with the skin of a hard-boiled egg! Rather ingenious techniques to promote hearing of a ruptured eardrum, I think.

I told you that a torn tympanic membrane would be the final acquired external ear problem which we would cover, but this next one still is a problem of the external. I am not sure, however, that it would be fair to call it an acquired problem. As Dr. Willeford mentioned, sizes of the external auditory meatus vary tremendously. Some children have large entrances from their pinnas to their external canals, most children have average ones (by definition), but a few children have only tiny slits. In this latter group there is a good possibility that the pressure of the earphones used in testing can close off the tiny entrance to the external meatus. When this happens there is no direct passageway of air between the sound source (earphone) and the tympanic membrane because a portion of the passageway has been squeezed shut. A hearing loss is expected under these conditions, and one in all probability would be measured. Note, however, that the "loss" is caused by the testing conditions, and these conditions are not present during the child's normal listening situations. In other words, the child exhibits an artificial hearing impairment created by the conditions of testing. The lesson to be learned from this is not to slap earphones on during auditory testing. When examination of a person's ears suggests the possibility of collapsing ear canals and a hearing loss is measured, note this possibility on the record (called an audiogram) and refer the person to an audiologist - he should be able to circumvent the problem which you noted.

Now, let us move on to acquired middle-ear difficulties. Perhaps the most common childhood impairment of hearing is due to a condition known as otitis media. Otitis, as it is sometimes called, can go through several stages, progressing from mild to bad to worse. I must stress at the outset, however, that any of the stages can be the terminal one for this problem, that if a doctor treats it or something fortunate happens, the condition need not progress from one stage to another. Instead, otitis media can be cured before it runs the gamut of severity.

Dr. Willeford has introduced us to the anatomical passageway between the floor of the middle ear cavity and the region of the throat known as the nasopharynx; you will recall that it is named the Eustachian tube. This passageway is closed at the bottom (nasopharynx) most of the time; however, normally when you swallow, chew, or say /ka, ka, ka/", for example, the Eustachian tube typically opens. Now, what happens ? When the tube is open, there is a continuous passageway from the external environment to the middle ear spaces, (mouth to throat to Eustachian tube to middle ear) so fresh air can enter (or stale air can leave) the tympanic cavity. Very quickly, however, the Eustachian tube closes and the air is trapped in the middle ear. What I have just described is normal functioning, and it serves a couple of purposes. First of all, it allows fresh air to reach the middle ear tissues, so they have a supply of oxygen, which they need. In the second place, the momentary opening of the Eustachian tube allows air pressure equalization on the two sides of the tympanic membrane - let us see how this works. When you go to Aspen from Denver, you usually go over two high passes, Loveland and Vail. As you start up these mountains, you are about a mile above sea level; associated with this altitude is a given air pressure (atmospheric pressure). Your Eustachian tube opens and the air pressure on the two sides of the eardrum becomes equal (due to physical laws of nature). Then you drive up the *mountain until you are more than two miles above sea level. At this altitude the external atmospheric pressure is less than it was at the bottom of the pass, but the air pressure within the middle ear is still as it was at the bottom of the mountain. Thus, it is greater than the atmospheric pressure. In other words, as you go up the mountain, the external air pressure becomes less and less, but the internal air pressure of the middle ear remains the same because the Eustachian tube does not open. Finally, the pressure differential becomes great enough for you to notice a sensation of fullness in your ears. You yawn, and this opens the Eustachian tube, allowing air to rush from the area of greater pressure (i.e., the middle ear) via the open Eustachian tube to the area of lesser pressure (i.e., the external environment) via the throat and mouth. The reverse process occurs during descent.*

What does all of this have to do with otitis media? The above discussion concerns only the normal mechanism. When certain conditions arise, however, such as swelling in the region of the nasopharynx due to allergy, cold or infection, the Eustachian tube can become incapable of opening periodically as it should. The aid which the middle ear received prior to the tube's shutting can not last forever. The tissues of the middle ear and its surrounding mastoid air cells slowly absorb the oxygen and nitrogen present in the trapped air. With the Eustachian tube not opening as it should, these components of air are not replaced, so the tissues deplete the air of these required nutrients. Using up the air decreases the air pressure in the middle ear so, soon, there is a condition of less air pressure within the middle ear than outside it. The eardrum is pushed in slightly by the greater external air pressure; the drum is said to be retracted, and this oftentimes can be observed by doctors. There is not a very severe hearing loss at this stage.

If fresh air cannot enter the middle ear and the old air has been used, the tissues do not remain perfectly healthy. They need oxygen, but they cannot get it. In order to combat the need for nutrients, more blood is sent to the tissues. Before long a straw-colored fluid is discharged by the tissues into the tympanic cavity and mastoid air cells. This fluid can only accumulate, because it has no place to go. It is easy to see why ossicular motion is soon impeded, so a hearing loss ensues. As long as the fluid does not become infected, a condition known as serous or secretory otitis media is present. Such a problem may not only be medically significant, but educationally significant as well, because of the hearing loss which it causes. If the person gets medical treatment, that can be the end of otitis media.

If, on the other hand, it is an infection which causes the swelling in the back of the throat, it is very easy for the infection to get into the fluid and go on a rampage. Such a problem is known as suppurative or purulent otitis media, and it is one of the advanced stages of otitis. Not only is there fluid, but it is infected. This is a very serious medical problem, because if it remains untreated it can cause the mastoid air cells and ossicles to decompose. The tympanic membrane can easily rupture, and a foul-smelling fluid can be discharged. Worse yet, the thin roof of the middle ear cavity (the tegman) can be eaten away until the infection has a clear avenue to the brain. Death, then, can be the terminal stage of otitis media. Or, if the tegman does not give way, the fluid can become thicker and thicker until it is so gooey and adherent to itself and middle ear structures that it is very difficult to remove, even with a doctor's suction device. This latter stage of otitis is referred to by a self-explanatory name: glue ear.

Surgeons used to operate on the middle ear in an attempt to clean out the infection and infected areas; the operation was called a mastoidectomy. Fortunately, drugs (sulfa drugs and anitbiotics, primarily) have now been discovered which control the problem quite well. Another form of treatment consists of surgically slitting the eardrum (called a myringotomy) to allow some of the accumulated fluid to escape. In addition, treatment must, of course, be aimed at the original problem which caused the Eustachian tube to malfunction in the first place.

So we have run the gamut of severity all the way from a retracted eardrum to a condition which causes very significant impairment in children, both educationally and medically speaking. This is, I am afraid, one of the problems which you can expect to encounter if you do hearing evaluations in the schools.

Another problem which occurs all too frequently is known by the impossible name of cholesteatoma. It is related to the fact that people normally slough off the outermost layer of skin. This happens all over the body, including the skin layer of the external auditory meatus and the eardrum. The sloughed off skin usually is washed away or it just flakes off, but in the ear canal it can more easily be retained to accumulate. In these cases the dead skin often gets started building upon itself in a retracted "pocket" near the top of the tympanic membrane. As the debris continues to build up in the form of a cholesteatoma, it balloons into the middle ear, causing a pressure type of erosion of structures and a hearing loss of severity which varies from case to case. Cholesteatomas can become infected quite easily. Obviously, treatment consists of removal, either through surgery or through irrigation to wash them out.

Some of the more common external and middle ear difficulties have now been covered. Let us continue our discussion of hearing disorders by moving more centralward, to the sensori-neural mechanism.

Certain illnesses of a systemic nature are known to affect the hearing of some individuals who suffer these diseases. One such problem is mumps. A child even can have a subclinical case of mumps - i.e., one which does not appear to be very severe - which can very severely depress his hearing, usually in one ear only. Another disease which can typically cause severe hearing loss of a sensori-neural variety is meningitis.

Certain drugs can damage the hearing mechanism, as well; the problem is referred to as ototoxicity. "Oto" means ear and "toxicity" means poison, so you see that the drugs under consideration act as poison on the auditory system, usually in the cochlea at the level of the hair cells. Some of these drugs are quinine, neomycin, kanamycin, streptomycin, and dihydrostreptomycin.

There is an interesting history concerning the latter two drugs. Streptomycin is an effective medication for combating tuberculosis, but one of the side effects which was noted early is that it often affects the vestibular (balance) mechanism (a part of the ear) in many people so treated. In order to circumvent this undesirable side effect, drug companies experimented with slight modifications of the drug; they attempted to synthesize a product which would continue to control tuberculosis, but which would not have the side effect on the vestibular system. They concocted a drug called dihydrostreptomycin. It did control T.B., and it did not attack the balance mechanism, but it did severely attack the cochlear system!

Exposure to intense noise can lead to sensori-neural hearing loss. Noise can be damaging whether the exposure is to a single blast of great intensity or a relatively continuous exposure to loud noise over a period of time. Examples of potentially damaging noise sources are tractors, airplanes, high powered rifles, shotguns, and firecrackers. The course of the difficulty is quite predictable. If the hearing difficulty is due to a single acoustical insult of great intensity (as, for instance, a firecracker explosion near one's ear), the ensuing hearing difficulty is labeled acoustic trauma. Tinnitus (ringing of the ears) usually is noted by the subject and a hearing test usually reveals normal hearing for low and middle frequency sounds with a localized hearing loss for high frequencies, most pronounced in the frequency region around 4000 Hz. The severity of the loss will be dependent upon the intensity of the blast and the individual susceptibility of the ear to such damage. If the hearing loss is brought on by long term exposure to relatively steady intense noise (as, for example, in a noisy factory), it is labeled noise-induced hearing loss, and its course is somewhat more complex. One of the initial symptoms of impending damage to the ear is a periodic tinnitus and temporary hearing loss (restricted to the frequency region around 4000 Hz) limited to during and shortly after the exposure to excessive noise. With continued exposure the hearing impairment gradually becomes permanent and begins to affect frequencies in the range below 4000 Hz. The severity of the loss will be dependent upon the intensity of the noise, the length of exposure, the pattern of exposure (on-time vs off-time), the susceptibility of the individual exposed, and a few other complex considerations. The treatment of these types of hearing losses is preventive in nature: (1) removal of an individual from the noisy environment (change jobs, for instance), (2) reduction of noise at the source (quieter tractors), or, most popularly, (3) reduction of noise at the ears (ear muffs or plugs, but not dry cotton which does no good).

The final type of difficulty which we shall discuss is neither conductive nor sensori-neural in the usual sense of the words. Instead, there is the symptomatology of a hearing loss (i.e., a lack of response to soft or even loud sounds in one or both ears) in the face of no known real reason for the loss. This difficulty is called functional or non-organic hearing loss or pseudohypoacusis. Such a "hearing loss" may be due to a psychological cause over which the individual has no conscious control; in other words, the person with this type of difficulty is not really aware that he has no organic basis for his hearing loss symptomatology. Another type of functional hearing difficulty is due to the subject's dishonesty. He realizes that he can hear sounds even *though he refuses to make any overt response to them. Regardless of whether there is a psychological or dishonest cause for the lack of response to certain sounds, there usually is some detectable motive or realization of gain by the afflicted person; for instance, the educational and/or social demands made of the person with functional hearing loss may be lightened due to the hearing difficulty, so the person consciously or unconsciously reaps benefits from rejecting sound. The audiologist's responsibility in these cases (not the speech aide's job) is to determine the organic hearing abilities; several special audiological test procedures are available to aid him. Treatment for this difficulty is not the responsibility of anyone except those responsible for professional guidance (such as the psychiatrist or psychologist), because mismanagement could lead to dire consequences. This means that you must not attempt to "talk people out of their losses", but you should be aware of the problem since it apparently is increasing in incidence among school age children.*

As mentioned at the outset of our discussion, we have had to be very selective in what we talked about. There certainly are a good many more things which can and often do go wrong with the auditory system of humans, but these things are not often found among the school-age population - thus, we have omitted them for our consideration. As I informed you earlier, I certainly have not made M.D. 's of you!

Hearing Evaluation

Richard H. Sweetman, Ph.D.

The evaluation of hearing would appear to be a simple process. Let us quickly dispel this notion, however, by stating one of the audiological facts of life: it is impossible to measure hearing at the present time.

Now, I had better elaborate on the above statement before you stop listening to me. It is true that hearing cannot be measured at this time; but we can attempt to evaluate hearing at this time. In order to reconcile the apparently conflicting ideas of the preceding sentence or to bridge the gap between the ideas, we must understand that our procedures for evaluating hearing do not really measure that sensation which we call hearing. In order to truly measure hearing we would have to enter the skull and brain of the listener and measure the interpretation of electrical energy which reaches the brain as a result of given acoustical energy delivered to the listener's ear. That, of course, sounds difficult, and it is difficult - so difficult, in fact, that I am unaware of anyone even coming close to accomplishing it. But this does not automatically mean that we cannot evaluate hearing. It merely signifies that hearing evaluation is a rather indirect procedure. Instead of measuring hearing itself, we evaluate hearing by noting or measuring a response to the sensation of hearing. The response can vary from the raising of a hand when a signal is heard to the repeating of a word to the recording and even measurement of electrical potentials in the cochlea, auditory nerve or brain which are thought to be highly correlated with the sensation of hearing. You see, then, that when we say that we are measuring hearing, we do not mean that we are measuring hearing itself but that we are measuring and evaluating responses which are thought to be (and in all probability are) highly correlated with hearing. There is a very important, if subtle, difference between measuring hearing and measuring responses thought to be associated with hearing. I hope that this difference is clear to you.

One type of hearing evaluation procedure does not even purport to be a procedure of hearing measurement; instead, it is a procedure of sorting. This area of hearing evaluation is called hearing screening, and it is a very important facet of hearing conservation programs. This branch of hearing evaluation is so important to you that Dr. Johnson will be discussing and demonstrating and letting you practice it very soon. Thus, I shall say no more about it except to mention that it should be included in the scheme of hearing evaluation.

The actual evaluation of hearing has several apparently diverse reasons for being. To some of you, perhaps the most obvious purpose of hearing evaluation is to describe the degree of hearing impairment, or, perhaps even more important, to describe the degree of residual or remaining hearing.

That is right - audiological results can provide the basis for predicting the expected significance of a given hearing loss. This is a very important function, but it is one which we professionals sometimes forget. It is all too easy for us - and perhaps it will be easy for you, also - to get so caught up and impressed with our technicalities that we ignore our clients as people. We must remain on guard and not forget this obvious fact.

Hearing tests have more glamorous functions, as well. The least of their glamorous purposes is perhaps to allow analyzation of obtained or expected results of treatment or habilitation. This includes using pre-operative and post-op hearing evaluations to determine the effects of medical treatment. This includes employing hearing evaluations to help a patient decide which, if any, of several hearing aids appears to offer good chances of success. This includes using hearing tests to determine the effects of various educational procedures. And, finally, this includes employing hearing evaluations to determine the course of habilitative action to be recommended for an individual, e.g., is speechreading (lipreading) and/or auditory training instruction indicated - is special education indicated?

Probably the most glamorous function of hearing evaluation is to aid the physician in diagnosing etiology and determining treatment for various hearing impairments. It is true - audiology can and often does make a real contribution here. For instance, until recently the audiologist with his hearing tests could often obtain results which indicated the presence of auditory nerve involvement (which, if it were a tumor, could lead to death if undetected and untreated long enough) some eighteen months before other medical specialists! You probably will not be in on much of this kind of work, although you may be only one step removed from it if it is on the basis of your results that children are referred for audiological evaluation.

But enough philosophizing - we must get on to what a hearing evaluation entails if we are to really understand how the above purposes are realized.

To evaluate hearing, an instrument is needed which will produce given sound stimuli. Many years ago this instrumentation consisted of a watch (employed to determine how far away from the ear its ticking could still be heard) or a heavy coin (used to determine whether dropping it on a hard surface was heard as a dull thud or a ringing sound). Otologists and forward-looking audiologists still use tuning forks to obtain information about the state of the auditory mechanism; these instruments can provide a great deal of information. They are particularly useful in confirming certain impressions which are yielded by more complex audiological tests. We certainly have no right to make light of tuning fork results merely because they are not as quantitative as some of the results which our other tests are capable of yielding.

The basic instrumentation which most audiologists employ today is the audiometer. (You probably will use this instrument at times, too.) Audiometers are the intricate, electrical instruments which are employed in the evaluation of hearing. One of the main features of these instruments is that they *allow various types of stimuli to be delivered to one or both ears, and these stimuli can be controlled so far as various parameters (such as intensity) are concerned. This ability to rather precisely control and quantify various parameters of testing signals has meant a lot to the field of audiology; in fact, it is the foundation of some branches of audiology. Some audiometers only are capable of producing pure-tone stimuli (such as the sounds which a tuning fork emits); others allow speech to be delivered to subjects' ears; still others are capable of handling either stimulus. In addition, other features oftentimes are incorporated into audiometers, some of which we shall discuss and some of which we shall not worry about.*

For our purposes today, we shall limit ourselves to puretone and speech audiometry. It is my intention to introduce you to the principles of such testing - I can not even try to make competent testers of you.

To describe a given audiometer in detail would be a waste of time since there are several makes and models, all of which are somewhat different. Instead, I shall discuss components which are common to most audiometers. I have never seen an audiometer without an on-off switch; its purpose should be obvious. Modern audiometers also are equipped with two earphones. One phone usually has a conspicuous red or black marking on it, and it is best to get in the habit of putting this phone on the subject's right ear; the other phone is marked by a blue or gray mark, and it should be placed on the left ear. A bone conduction vibrator also is supplied with most audiometers; we shall discuss its use later. Audiometers have a switch which allows the tester to deliver the stimulus to the right ear (phone), left ear, or bone conduction vibrator. Puretone audiometers have a prominent frequency dial which allows the tester to determine what frequency reaches the subject's ear. Equally prominent is a dial which controls the intensity of the signal to the ear-phone. The unit of intensity which is employed is the decibel (dB). Zero on this dial represents an intensity which has been determined to be the softest signal to which a normal-hearing person can respond; the larger numbers describe the intensity in decibels above this zero reference which can be delivered to an earphone. Most audiometers also have a dial labeled "masking;" you need not worry about this one, except that it should be off.

Basic to most of the measurements which we shall discuss is the concept of threshold. This is a very involved concept, but for our purposes we shall think of it as the least intense stimulus to which a person can respond consistently.

When an earphone is placed over a subject's ear and a stimulus is delivered to it, you can see that the ear is being stimulated in the same manner that it is during everyday life; i.e., the stimulus is emitted into the air surrounding the ear; the sound energy travels through air down the external auditory meatus, activates the eardrum, middle ear bones, and finally the cochlea, VIIIth cranial nerve, and brain (assuming no pathology). This mode of hearing is called the air conduction (A/C) mode, because the initial transmission of acoustic energy to the auditory system is via air. The purpose of testing hearing *by this mode (i.e., air conduction) is to describe the degree of hearing loss (or residual hearing) for a given stimulus when the entire auditory system, from the pinna to the brain, is employed. The entire mechanism of each ear is separately evaluated with several pure-tone stimuli, usually at octave intervals between 125 or 250 Hz and 8000 Hz. The intensities required to elicit thresholds for these stimuli are recorded on a form called an audiogram. See Fig. 1 for an example. Red circles are used for the right ear (it is easy to remember: round, red, right) and blue 'X's" are used for the left. (Here both colors will print black.) The results of each ear are connected by an appropriately colored continuous line. You can see that an A/C configuration is quickly apparent for each ear, and this configuration in itself may have a good deal of diagnostic information. In Fig. 1, for example, a typical A/C configuration for acoustic trauma is shown in the right ear, while the left ear exhibits an A/C configuration of a mild to moderate degree of severity, consistent with serous otitis media.*

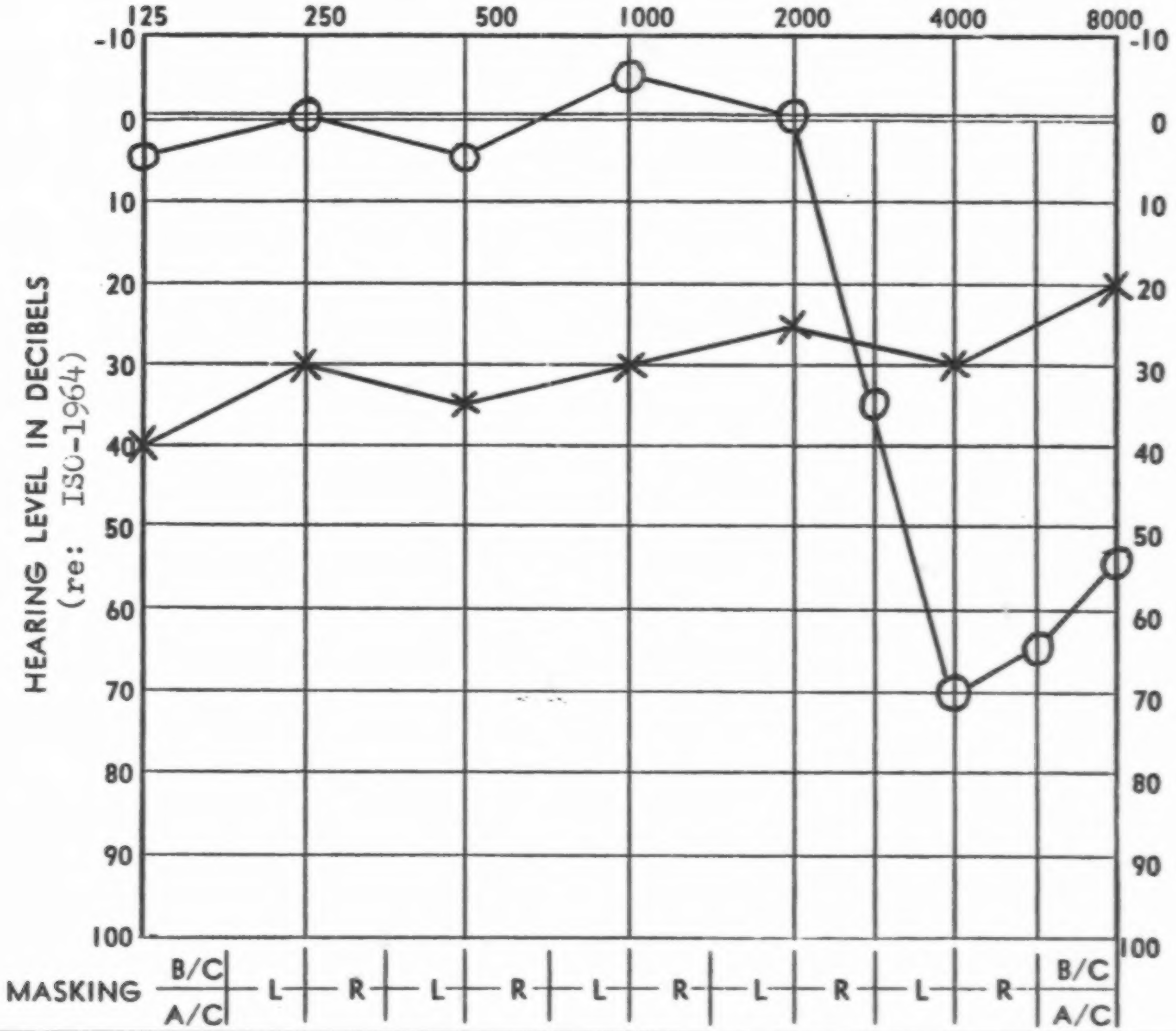
A second type of pure-tone audiometry which is routinely performed utilizes not earphones to deliver the stimuli to a subject's ears, but a bone conduction oscillator (vibrator). This is a small plastic device; it is usually placed directly against the skin over the mastoid process (the bony prominence just behind the pinna). Then it is activated, it begins to vibrate at the frequency of the selected stimulus. Because this vibrating device is in semi-direct contact with one of the bones of the skull (the mastoid process), the bones of the skull are forced to vibrate at the same rate. Some of the energy which is now inherent in the vibrating skull is transmitted to the cochlea, essentially by-passing the outer and middle ears. You can see that this is ***not*** *the way in which we normally hear, since the only parts of the auditory system which are activated are the cochlea, VIIIth cranial nerve, and brain - the external and middle ears, conducting structures are not activated. Instead, the initial transmission of acoustic energy to the auditory mechanism is via the bones of the skull; hence, this mode of hearing is termed the bone conduction (B/C) mode. The purpose of testing hearing by B/C is to describe the degree of hearing loss for a given stimulus when only the sensori-neural auditory system is activated, i.e., from the cochlea to the brain.* The sensori-neural mechanism of each ear is so evaluated with several pure-tone stimuli, usually at octave intervals between 250 and 4000 Hz. The intensities required to elicit thresholds for these stimuli*

** Because the entire skull is vibrating in bone conduction audiometry, both ears (cochleas) are stimulated simultaneously, so it often is a bit tricky to be sure that responses elicited from an individual are due to hearing in the ear we think we are testing and not the other one. In order to get around this problem, so that we know that it is the test (as opposed to the non-test) cochlea which is responsible for given responses, we render the non-test ear incapable of hearing test stimuli which may get to it. This is done by delivering noise (via air conduction - i.c., through an earphone) to the non-test ear. This process and procedure is called masking.*

AUDIOLOGICAL RECORD
University of Colorado
Speech and Hearing Clinic

NAME____________________ AGE________ DATE__________

AUDIOMETER USED____________________ TESTED BY______________



Ave. Loss
500-2000 cps.
RE _____ db.
LE _____ db.
BE _____ db.

SRT
RE _____ db.
LE _____ db.
Bin _____ db.

PBQ ___ SL
RE _____ %
LE _____ %
Bin _____ %

PBN ___ s/n
RE _____ %
LE _____ %
Bin _____ %

KEY TO AUDIOGRAM

Air Conduction
  R — o—o (red)
  L — x—x (blue)
Bone Conduction
  R — [——[(red)
  L —]——] (blue)
Tolerance
  R —△ ——△ (red)
  L —▽ ——▽ (blue)

TEST CONDITIONS

1. Quiet Moderately Quiet Noisy
2. Test Reliability: Poor Fair Good
3. Hearing: Constant Variable
4. Hearing today: Average Better Poorer
5. Cold today: Yes Slight No
6. Hears Better in: Quiet Noise Doubtful
7. Tinnitus: R L Bin

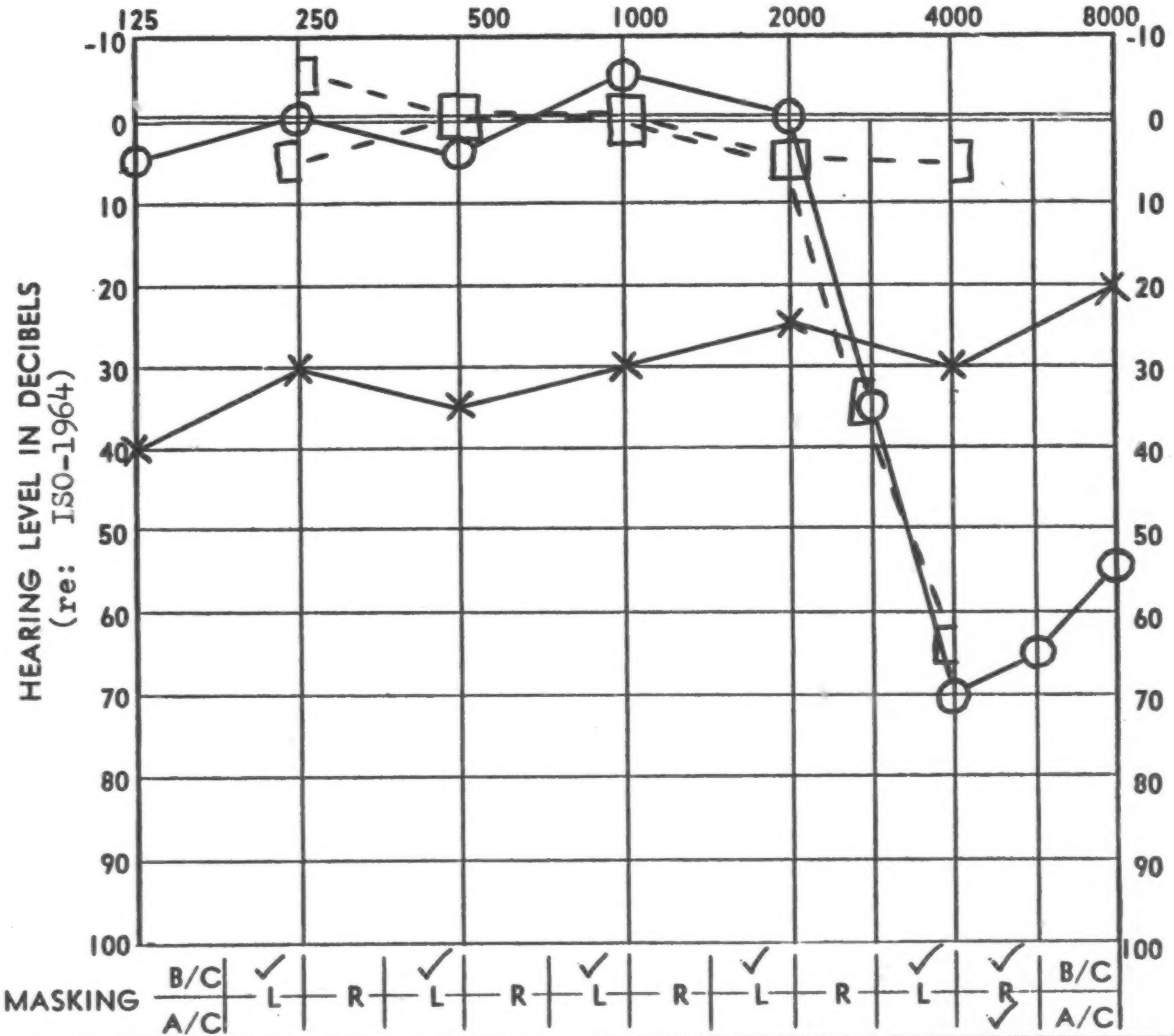
REMARKS:

Fig. 1.--Sample audiogram with typical air conduction configurations for acoustic trauma (right ear) and serous otitis media (left ear) portrayed.

AUDIOLOGICAL RECORD
University of Colorado
Speech and Hearing Clinic

NAME____________________ AGE______ DATE__________

AUDIOMETER USED________________ TESTED BY____________



Ave. Loss
500-2000 cps.
RE _____ db.
LE _____ db.
BE _____ db.

SRT
RE _____ db.
LE _____ db.
Bin _____ db.

PBQ ___ SL
RE _____ %
LE _____ %
Bin _____ %

PBN ___ s/n
RE _____ %
LE _____ %
Bin _____ %

KEY TO AUDIOGRAM

Air Conduction
R — o—o (red)
L — x—x (blue)
Bone Conduction
R — [——[(red)
L —]——] (blue)
Tolerance
R —△ ——△ (red)
L —▽ ——▽ (blue)

TEST CONDITIONS

1. Quiet Moderately Quiet Noisy
2. Test Reliability: Poor Fair Good
3. Hearing: Constant Variable
4. Hearing today: Average Better Poorer
5. Cold today: Yes Slight No
6. Hears Better in: Quiet Noise Doubtful
7. Tinnitus: R L Bin

REMARKS:

Fig. 2.--Sample audiogram with typical air and bone conduction configurations for acoustic trauma (right ear) and serous otitis media (left ear) portrayed.

are recorded on the same audiogram which was used for A/C results. See Fig. 2 for an example. Symbols for B/C audiometry are not as well standardized as those for A/C, but usually a red [or < is used to denote right B/C results and a blue] or > is employed for left B/C findings. The results or each ear are connected by an appropriately colored dashed line. A comparison of air and bone conducted thresholds is easy to make; for instance, in Fig. 2 the right ear exhibits no significant difference in thresholds for A/C and B/C (there is said to be no air-bone gap), whereas the left ear exhibits an air-bone gap at all frequencies tested.

The discrepancy, if any, between air and bone conduction thresholds is very important to the physician, because it contains a good bit of diagnostic information. We should be able to understand why this is so if we really understand what is going on during A/C and B/C audiometry. Recall that the A/C procedure utilizes the entire auditory system, while the B/C technique utilizes only a part of that system, the sensori-neural mechanism. If A/C and B/C hearing levels are equally depressed, the reason for the hearing loss would logically reside in the sensori-neural mechanism, for testing of that part of the system (by B/C) yields no different results from those obtained when the entire mechanism is sampled (by A/C). If, on the other hand, B/C results are average (around 0 dB) and A/C is depressed (i.e., an air-bone gap with B/C being normal), the reason for the hearing loss would logically reside in the conductive mechanism. The reason is clear: there is a hearing loss due to trouble someplace in the entire auditory system (as evidenced by A/C results), yet there is no difficulty in the sensori-neural system (as evidenced by B/C results); by a process of elimination then, the conductive mechanism must be responsible for the hearing impairment. A mixed hearing loss (due to simultaneous problems in both the conductive and sensori-neural systems) shows up on the audiogram as an air-bone gap with B/C depressed from average but not as far depressed as A/C. (You should be able to logically see why this is so, too; try it.)

Another stimulus oftentimes employed in audiological evaluation is speech. This signal is difficult to specify in a precise fashion since it is constantly changing. In addition, test materials which are used must be standardized for two reasons: (1) some words (or other speech materials) are easier to hear than others, and (2) comparison of results from one session or clinic to another is possible only if similar material is used on both occasions. Despite these difficulties, which can be overcome, the speech stimulus has a very high face validity as a useful signal in the evaluation of hearing, because it is speech which is the most important things to which a persons listens in everyday life.

A threshold for simple speech is commonly obtained; it is called a speech reception threshold (SRT). The SRT is similar to a pure-tone threshold except that the result indicates the least intense speech signal to which a person can consistently respond. (Usually the client is asked to respond by repeating simple, two-syllable words, called spondees.) This procedure yields a single value in dB describing the amount of hearing loss in terms of sensitivity to speech. This single value is one basis upon which a rough description of the severity of loss of hearing sensitivity can be made:

SRT	*Qualitative description of hearing sensitivity*
-10 to about 20 dB	*Normal*
about 20 to 50 dB	*Mild degree of loss*
about 50 to 70 dB	*Moderate degree of loss*
about 70 to 95 dB	*Severe degree of loss*
greater than about 95 dB	*Profound degree of loss*

I hesitated before I presented the above values to you, because such a description can be dangerous if blindly applied. People, not statistics, suffer hearing losses, so the above values must be viewed as approximations only. Differences in terms of sensitivity between hearing impairments of 48 and 52 dB probably are insignificant. Also, a few people with bilateral 60 dB SRT's will behave as if they have a mild loss, while a few others with the same loss will act as if they have a severe impairment. Obviously, the degree of difficulty which a given hearing loss imposes on an individual will be a personal and variable matter.

There is another aspect of hearing for speech which is very important, and it refers to the clarity with which speech is heard when it is loud enough to be easily heard. In other words under good listening conditions, is speech clear and precise or is it garbled and "mushy" to some degree? This aspect of hearing for speech is evaluated through tests of discrimination for speech; the evaluation procedure also is referred to as PB testing or testing for PB Max. Word lists, each made up of 50 specially chosen items, are delivered to the individual. Each word correctly responded to is assigned a value of 2%; a PB score of greater than about 92% is considered normal.

Several years ago work was done to devise a scale which combined the information yielded by speech reception and speech discrimination testing results. This scale, called the Social Adequacy Index(SAI), employed the SRT and PB score to assign a single numerical value (in neither per cent nor decibels) which represented the social significance of the given hearing problem. It certainly is a worthy idea, although it has not caught on for several reasons. First of all, it is a very difficult concept to validate, and in the second place, the standardization procedures were done utilizing speech materials which no longer are in common use. Nevertheless, an enterprising chap may someday overcome these problems, and you may hear of it.

Routine audiological evaluation usually consists of the above-discussed testing methodologies. Pure-tone hearing evaluation, consisting of air and bone conduction audiometry, usually is carried out initially. It is followed by evaluation of hearing for speech, consisting of speech reception and discrimination procedures. Although we shall cover no more tests, you should be *aware that there are several other evaluative techniques which allow the audiologist to further delve into the area of his client's hearing abilities if such appears to be necessary.*

With the above limited description of procedures for the evaluation of hearing as a basis, let us relate audiological techniques to audiological purposes. One of the purposes of audiological evaluation is to describe the degree of hearing impairment or amount of residual hearing; this can be accomplished by evaluating sensitivity to air conducted pure-tones and by measuring sensitivity and discrimination for speech. Another reason for audiological testing is to analyze the effects of treatment or habilitation; this can be realized by comparing audiological findings before and after such treatment or education. One other purpose underlying the evaluation of hearing is to aid the medical profession in diagnosis; this can be done by interpreting pure-tone air and bone conduction relationships, speech audiometric results, and a host of findings yielded by special tests (which we have not discussed).

One final thought: The only way that you can hope to learn anything from what I have presented today, or to even begin to apply it, is to understand it. You cannot simply memorize these concepts, so do not even try. Now, you may think that I simplify your task by telling you not to commit facts to memory; in reality, though, I make your task far more difficult by admonishing you to understand it.

Hearing Rehabilitation

Jerome G. Alpiner, Ph.D.

When we think of aural rehabilitation we think of a number of different factors that have to be considered with those who have hearing impairment. Aural rehabilitation is spelled a-u-r-a-l, not o-r-a-l which refers to speech. When we think about aural rehabilitation, we think about the following things: speechreading, auditory training, hearing aids, counseling, and psychological problems. These are the most important factors when we have to think about the rehabilitation of anyone who has a hearing problem, whether it be a child or an adult.

There are in the United States about fifteen million persons who have serious hearing impairment. There are approximately another 500,000 who are classified as profoundly deaf. We are making a little bit of a dichotomy here between those who are classified as hard-of-hearing and those who are deaf; although I should let you know that the professionals interchange the word deaf and hard-of-hearing. We have to be careful about who we are talking about. Someone may say, "That person is deaf", and yet the person may have only a mild or a moderate hearing loss. The important consideration is that you look at the individual: do not get caught in the dilemma of who is hard-of-hearing and who is deaf.

Since we are especially interested in children for the purpose of this training program, there are between 2% and 21% of school age children who have some degree of hearing impairment. There have been numerous studies on the incidence of the number of children who have hearing impairment in the school-age population. All of these studies range between 2% and 21% - quite a discrepancy, is there not? The best acceptable estimate is 5%. When we talk today in the profession we are usually talking about an incidence rate of 5% of school-age children who have some degree of serious hearing impairment. The next questions that might come to mind are: "How do we find out who these children are?" "How do we find out who these adults are that have hearing impairment?" "What do we do?"

Let us start with the preschool group. Actually we can go below what is commonly considered the preschool group and talk about infants in hospitals. You may have read various newspaper articles about a new program which has been introduced during the past few years in nurseries where the infants are given a hearing screening test. In Denver there are several hospitals that have now instituted this program of testing infants in the nursery. What you look for with the kind of test noise that is utilized is to find out if there is an awareness of sound that is introduced to the child in the nursery. The very fact that a child does not respond to the noise that is presented to him with the instrument does not mean that he has a hearing loss. In other words, he just may not be responding to that sound. Over a period of years, as those children who are *identified in the nurseries as potential hearing-loss babies become known, then we will be able to determine how valid these procedures are. A number of these infants who have hearing loss are going to be picked up in the nursery and as they are followed throughout their developmental years from infancy some of these children are going to be shown to have real hearing impairment. But this is relatively a new program and when we look back over the years we find out that we never really did much with these infants in trying to identify hearing impairment.*

It is a wonderful program and, as you see, the earlier we are able to identify children who have hearing impairment, the earlier we are able to start engaging them in aural rehabilitation and educational procedures. You should know by now from the lecture on language development that children learn many things from birth and if you consider that at the end of the first year a child has a vocabulary of three words and at the end of the second year he has a vocabulary of about 300 words, then think of the ramifications of that child who has a serious hearing impairment which has not been detected and no training or rehabilitation has been instituted! Speech and language are learned, not acquired, and consequently if you do nothing with that young one who has a hearing problem - if it goes unidentified - you are not going to have this youngster learning speech and language as you learned it because you had a normal hearing mechanism. This is one of the ways in which we are now starting to identify these youngsters as early as possible right in the nursery before that child goes home. In many instances volunteers or aides are used in this kind of a testing program.

As we go up the ladder, we talk about our preschool children. We may have some breakdown here until they get into a nursery program or a kindergarten program either private or in the schools, where the teacher can perhaps be the first one to realize that something is wrong and that a child appears to be missing verbal information and not paying attention. When the child is called there is no answer; the doorbell rings, or there is a loud noisemaker in the room and the child does not respond. This is a clue to that teacher that maybe there is something wrong with that child. From our point of view then, there is a certain amount of public education that we have to engage in to orient regular public and private school nursery and kindergarten teachers. On the other hand, parents will tend to pick up the fact that children are not hearing certain things or information; the child is not responding when called, may not hear an alarm clock; unfortunately not all of these children are identified at this preschool level. Many more are being identified than in the past.

When a child enters into regular school programs, you will find that most of your school programs today will have a hearing testing or screening program as part of its health-related and health services program. This is one thing in which aides can very definitely engage: the screening programs in your schools. In my opinion you have a very definite role from the hearing point of view. I would like to take this even beyond school-age children to have you see the proper perspective of aural rehabilitation. Children are not the only ones who have hearing problems as you should well know.

We can talk about community hearing conservation; we can talk about industrial hearing conservation; we can talk about military hearing conservation; and we can talk about geriatric hearing conservation. What procedures are available in the community for you as an individual to go to some kind of a mobile unit and have your ears tested as you would to get a chest x-ray to find out if you are a potential tuberculosis carrier? Can you recall any types of mobile units where you can do this? Adults in the community have a great tendency not to admit they have a hearing loss; males particularly do not like it for one reason or another: seems as though it is a blow to masculinity to have a hearing loss and perhaps wear a hearing aid. Women do not like it because this takes away their femininity because of someone seeing a hearing aid (although generally a woman's hair can hide most of the hearing aids worn today). Adults may not be as anxious or eager to do anything about a hearing loss. This is kind of a natural phenomina unless it gets so severe, or there are other problems associated with just the hearing loss, that forces them to go to the physician.

We learn of industrial hearing problems. People who work in factories where there are particularly loud noises at certain frequencies with exposure over a certain period of time may be susceptible to hearing loss. In other words, loud sounds can cause hearing loss and it can be a very gradual progression. Many industries have instituted hearing conservation programs where workers wear ear plugs or ear muffs especially designed to attenuate, or cut down, on the intensity or volume of the noise to prevent hearing loss. They have instituted programs whereby they test the hearing of the worker before he starts on the job and they test him periodically to see what is happening to his hearing.

This brings us to the next type of hearing conservation which is military hearing conservation. More and more military personnel are going to incur a hearing loss now because of combat. Loud noises (this is not even considering the physical damage that can happen as a result of gunshot wounds), the continual exposure to rifle fire, to rockets, to jet aircraft, etc. may cause hearing loss. It will be a noise-induced hearing loss similar to that of industrial hearing loss. In the military, some of the hearing loss can happen instantaneously which we call acoustic trauma, such as when a rocket is dropped and explodes near someone. Here we can pinpoint when that hearing loss commenced because it was that explosion which caused it, whereas most of your industrial type hearing loss will be a progressive type.

The final type of hearing conservation program I wish to mention is geriatric, geriatric referring to the aged. The hearing loss in this population is due to the actual aging of an individual and is called presbyacusis. This is hearing loss due to the aging process; we are not talking about ear infections or ear diseases. We are talking about the normal process of aging. To give you some idea of the progression or deterioration of hearing as a result of aging, let me give you some Public Health Service estimates. For example, in the group of people approximately 25 years of age, the incidence of hearing impairment is 25 out of every 1,000 people, and at age 75 and over it is 250 out of every 1,000. You get an increase in the incidence of hearing loss as people grow older. Many *people think we consider the aging process begins at age 65. This is not true. It can begin in some people well before age 65 because chronological age is no index of our actual physical age. There are more older people today because of our advances in medical science, and consequently the need for rehabilitation at the other extreme is also great.*

This gives you some idea of the total picture. When you think of hearing loss, I do not want you to confine your thinking only to the infants or to the preschoolers or to the school-age children even though you are going to be primarily concerned with school-age children. I want you to see this total picture; it is a very serious problem and there is considerable work to be done in rehabilitation. There are not as many people who become interested in aural rehabilitation in our field as become interested in the evaluative procedures of testing hearing or in acoustical research. My only point here is that you do not find as many professionals interested in aural rehabilitation as you do in other areas of audiology.

Let us talk first about speechreading. This is one of the major aspects of aural rehabilitation. I have given you the term speechreading; this is one of the more preferred terms, although there are other words used to describe it. You recognize it in the traditional word of lipreading; other people have called it visual hearing and visual communication. In other words, they all refer to the same process. If you put an article in the paper about visual hearing, just by the by-line in the paper the average layman will not know what you are talking about. But if you put an article in about lipreading that layman is going to know that you are talking about lipreading - whatever lipreading is. We will discuss it a little more in detail.

What do we do in lipreading? What is our philosophy? Many people think that in lipreading we are going to be able to solve all the problems of that person who has a hearing loss, whether or not he wears a hearing aid. He may have a mild hearing loss that is progressive and yet not need a hearing aid but he should undergo some lipreading training as a kind of preventive medicine. There are many sounds that are not visible on the lips. You cannot lipread on the telephone. You cannot lipread when it is dark, and you cannot lipread when somebody is not looking directly at you. It is not a panacea although I do not want to underestimate it either. It may be very helpful to those individuals who have hearing loss. We have been investigating this process of lipreading for a long time trying to find out, "How can we predict if you are going to be a good lipreader?" We find information that age has no correlation with how well you lipread; intelligence has no correlation with how well you lipread; the onset of hearing loss has no correlation with ability to lipread; so for a long time we have been groping in the unknown. We have been saying that lipreading is helpful, and it appears to be - but when you get right down to it and try to analyze it, you ask yourself, "Is this person going to be a good lipreader?" "Can we do an intelligence test on him to find out if, from his IQ, he is going to be a good lipreader?" We cannot do it. It can be rather frustrating from this point of view.

People have been advocating lipreading for a long time and I am an ardent advocator of it, and subjectively you can see where people are helped. There have been studies with normal hearing individuals which show that lipreading has helped before and ufter using film tests and other techniques. It is a fascinating area. I recall I once had a physician who knew seven languages and had a hearing loss; he came in for lipreading training and said, "You know, this is the hardest thing I have ever had to learn in my life." This man knew seven languages fluently. It makes you wonder, but the general philosophy of lipreading is to teach an individual, through the use of lipreading, to communicate as effectively and adequately as possible, using not only lipreading but all available sources. When we talk about lipreading, we are speaking about more than just your ability to look at my lips and be able to read my speech as I speak. When I teach a course in lipreading at the University to a group of hard-or-hearing people, the first thing I teach them is improvement in listening ability. I teach them how to become better listeners; I do not mean better hearers; I mean better listeners. Hear and listening are two different things. Hearing is having a hearing mechanism that receives sound and eventually gets it up to the brain for interpretation. Listening is being prepared to receive the communication; it is being alert; it is being set. In other words, if you have a hearing loss and you are not a good listener, you are going to miss quite a bit of communication. A. psychologist once did a study and found out that 40% of verbal information was filtered out by normal hearing people. This means, in the course of each day on the average, you may not hear 40% of what I have said to you, simply because you are not a good listener and there is nothing wrong with your hearing mechanism. That is a fantastic amount of information; so you can literally say, "It goes in one ear and out the other." Initially we try to teach these people to be good listeners; to pay attention; to receive the message. If you get involved in assisting anybody in running them through drills on lipreading, you have to keep this in mind.

Second, we do teach these people how to lipread (and there are various philosophies of lipreading). We do teach them the sounds that are visible on the lips. It is how we use these sounds and the approach we take that determines our real philosophy in this regard. For example, (p) and (b) look very much alike. There are three sounds that look alike and are visible on the lips. They are sounds for the letters (p), (b) and (m). We call these homophonous sounds, homophonous meaning that they look alike. These are not the only homophonous sounds. For example, if on the film a word was given to you such as "bet" with a 'b' and you identified it as "pen" with the 'p' you are really not wrong, because these are homophonous and that is the way they look. It does not help you very much in communication, if it could be either "bet" or "pen"; this leads to a very important issue in this whole matter of lipreading. The philosophy is not to get every little sound and every little word, but to try to grasp the thought. I have had people who had to get every little word and every little sound, and while I was giving them a sentence, they were still back trying to figure out the 'the' as the first word, and I had finished the sentence. If you have this kind of an approace it would be extremely difficult to learn how to speechread.

These three sounds, (p), (b), and (m) are homophonous but they are visible. There are two other sounds that are homophonous and visible; these are the sounds for the letters (f) as in 'father' and (v) as in 'vase'. They are formed without any voice with the upper teeth extending over the lower lips. Now the only difference here is that one is voiceless and one is voiced - with one we use the voice box, with the other we do not. The (f) is voiceless and the (v) is voiced. Another sound that is visible but does not have any homophonous counterpart is the (th). You will have this both voiced and voiceless. For (th) your tongue protrudes between your teeth, although you will note that there are people who make this sound and for some reason or other the tongue does not protrude between the teeth and this makes it extremely difficult for that speech-reader. These sounds are essentially visible to us.

We have other sounds that are not so visible and this is what makes lip-reading a little more difficult and usually dispels the notion that you can learn how to really lipread everything. Take sounds for the letters (t), (d), and (n). These are classified as homophonous because they look alike but you cannot see them very well. You see the shape of the mouth and what is done with the tongue looks essentially the same. Another sound that is difficult to see is the sound for the letter (l). Another group of sounds which are classified by some as homophonous are the sounds for the letters (k), (d), (ng), and (nk). As you look as a person you have a hard time finding out what sound he is making.

Then we go to another grouping of (sh), (zh), (ch), and the (j). If we make these they are classified by some as homophonous. Another sound that is difficult is the one for the letter (r); you do not have much of observe. We have two other homophonous sounds, the (s) and the (z). One is voiced and one is voiceless, not as easy to see as the (p), (b), and (m) or the (th). Then we have two others which are the sounds for the letters (w) and (wh). These are most of the sounds that are utilized in our language. Why do we use these sounds then if we cannot see all of them? We use these sounds and we teach them in lipreading instruction to provide structure for the individual who has to learn how to lipread. In other words, if you started out teaching people how to lipread and they did not have the slightest idea of what to look for, it would get to be frustrating. Lipreading is frustrating enough. If you start out and these people do not have any structure at all, they become discouraged and there are many people who would drop out after the first or second week of lipreading instruction. It is a good idea to start out with the easier sounds too, because it may motivate them. They feel good about it. When you come in and start a lip-reading class you tell these people that they may not know it but they can already lipread some. So can you. If someone came into this room and never uttered a word (example), you would know they said, "Good morning." And if you remember a week ago today, I might come and say (example), "It is snowing outside." You can already do some lipreading and it is good - because this reinforces the individual; it gives them motivation they need - and you start out with these easy sounds which are visible. Eventually, you structure your lessons and go into the more difficult ones, but you cannot rush these people. You have to go at their pace; you have to continually give them encouragement.

We have the same situation with vowels and diphthongs. For structuring we teach them these sounds: we have the long (e) and the short (e), for example, the (e) as in see, the (e) as in set. Then we have the short (a) as in bat; we have the short (i) as in bit. We have the short (u) as in cut; we have the (ah) and the (aw) and then we have the long (oo)

There are different classifications. Different people classify these sounds differently but this is a general structuring. I do not think you can go too far astray with this type of approach.

We now progress from teaching these people how to be better listeners to teaching them how these sounds do appear and how they are made, for the purpose of giving structure to a lesson. This is where we divide into two different philosophies used in the process of lipreading. One is known as the synthetic approach and the other is known as an analytic approach. The emphasis on the synthetic approach is that we try to teach these people to grasp the total idea. We are not dwelling on individual sounds or syllables. We are attempting to stress having these people grasp the meaning of a sentence. You do not have to get every word in a sentence to be able to get the idea of what it is. In the sentence, "I am going to go to the movies this evening", if you had to rely on lipreading in order to understand, maybe the only words you would have to get would be "I - movie - evening"; the important thing is that you would grasp the thought, though you may not get the other words. You would understand that this person is going to attend the movie this evening. In the analytic approach there is a great deal of emphasis on working with individual components - spending a great deal of time on sounds. In the analytical part of speechreading we can emphasize the consonant, the vowel, the consonant and vowel together which gives us the syllable, and the word. Now the word can either be analytic or synthetic. I will give you some examples of this in a lipreading lesson. This will give you some idea of the differences. In the synthetic approach you are really starting at this level of the word and moving to the phrase, to the sentence, and in general speech discourse of speech that occurs in conversation. Even in a synthetic approach we structure the lesson by stating that we are going to be working today on words and sentences that have these sounds in them; for example, (p), (b), and (m). We spend very little time on this, however, other than to identify the sounds, show the people how these sounds are made and let them practice with these sounds. You then move into words, sentences and into stories. You are taking a more total approach to communication.

In the analytic approach you would be spending most of your time, for example, with the sounds for the letters (p), (b), and (m), and using syllables. Now what can happen is that people tire of this very easily. With a synthetic approach you can use all kinds of materials and theme approaches to your lessons. It becomes very fascinating for the individual to do it this way.

We go from critical listening in these people to teaching them sounds, then choosing whether or not we are taking a synthetic or an analytic approach, but lipreading is even more than this. There are other factors we have to teach *these people. We teach them to be aware of gestures; this is important - gestures convey information. You can gesture and you do not have to utter a word and people will know what is meant. You have to let these people know that information occurs in gestures; not everybody gestures though - so once again, it is not a cure-all. Facial expressions are another avenue of conveying information. You can tell people who are sad or happy just by looking at their faces; they do not have to utter a word. The student who comes in and says, "How did I do on my exam?" And you go, (thumbs down) with your hands, and this is a female and tears start to come in her eyes, she does not have to tell you anything. You know she is unhappy about the situation. So facial expressions can convey information and should be a very important part of this total process. You may even want to classify things like gestures and facial expressions under listening - because listening is being prepared and you are set to receive the communication - all of these factors can be important.*

There are certain formal methods that have been introduced in this country. Some are foreign and some are developed here; I am only going to give you the names of them in case you hear them - but most people really do not adhere to a formal method today - it is too rigid. The two major analytical approaches are Jena and Mueller-Walle. The two major synthetic methods utilized are Nitchie and Kinzie.

The important thing to remember is that lipreading or speechreading can be very helpful to the hard-of hearing person. There are two major approaches to lipreading: the analytic versus the synthetic approach. Next you should be aware that lipreading or speechreading is not a panacea for hearing loss. It is one major part that can be used in this process of aural rehabilitation. It has its limitations and it has its advantages and you have to keep this in mind. If you do not keep this in mind you could steer persons far afield and have them become quite frustrated. With as many people who have hearing impairment, aural rehabilitation is an extremely important consideration. The final comment on speechreading is when you recommend it, you can generally classify hearing as normal, mild, moderate, severe, or profound hearing loss. If you have normal hearing you obviously do not need lipreading. If you have a mild hearing loss you may not need lipreading either; but what if the otologist says your hearing loss is progressive and as time goes by the hearing is going to deteriorate. This may be a candidate for speechreading. A person with a mild hearing loss, as indicated earlier, is going to be able to hear you but it is going to sound diminished in terms of volume. A person who has a moderate hearing loss is going to have to strain to get the meaning of what you are trying to say. Lipreading can be very helpful here. In other words, you get some of those clues, some of the words and some of the sounds and you get the whole thought. You use whatever hearing you have, either with or without the hearing aid, and it may be helpful. With a severe hearing loss you barely may hear or may not at all hear the person; than you have the person who has the profound hearing impairment who may not even be able to function with a hearing aid - or if he puts a hearing aid on he may only be able to hear noises or sounds because the hearing mechanism is so deteriorated or damages that all it may introduce is noise, but not speech as we understand it.

We have only talked in terms of volume. We say a person may have a mild, a moderate, a severe, or a profound loss based on volume. But there is another factor to consider whether or not a person should undergo some lipreading instruction. This is a person who may have discrimination difficulties in understand speech. The problem here is that because of the discrimination problem the person can hear you; he may even hear you with a hearing aid if he has a moderate or severe loss, by turning up the volume, but you have that classic statement, "I can hear you but I do not understand you." "The words are loud enough but I do not understand everything." Something is wrong in that hearing mechanism to cause this problem. This may be a candidate for lipreading. Because those auditory cues are not so good the person needs a little assistance and lipreading can provide that boost and help overcome discrimination disability. This is a factor to consider. It is not just a matter of volume, but it is also a matter of discrimination ability - the ability to understand these words clearly. If a person has a problem of discrimination then he is a candidate for speechreading to see what happens.

The second factor of aural rehabilitation is that of auditory training. When we talk in terms of auditory training, we are talking in terms of having an individual who has a hearing impairment getting the most out of the remaining hearing he has, with or without a hearing aid. In other words, we want the best use out of the residual hearing we can get. You are familiar with some of the discrimination problems that might exist; you are familiar with the intensity or volume aspect of a hearing loss and what it can do. The important thing, then, is to take these factors into consideration and get the best we can out of that individual who has hearing impairment. I like to look at auditory training from two points of view. One of these has to do with those individuals who have a congenital hearing loss. These are people who were born with a hearing impairment. If we go to the one extreme, as an example, and take someone who has a congenital hearing loss, what is lacking if this is a severe problem? The hearing mechanism is not functioning properly. Their input for speech and language is hindered, because they do not have the means with thich to learn language.

When we are talking about these children who have a severe congenital problem we are talking in terms of auditory training about learning speech and language. They have not had it. Suppose you get a two year-old youngster and he is identified as having a serious hearing problem. What are you going to do? He has already lost that background information for language. He has no standard or frame of reference such as you had when you learned your speech and language. So you have to back up; you cannot start at a two-year level so far as speech and language are concerned for this child. You have to teach this child speech and language from the beginning. He does not know what these things sound like if he has a very serious impairment.

You have the child evaluated and we are assuming that since this is a severe hearing loss, that a hearing aid is placed on the child; it may be one ear or both ears; then you start to teach him language. What are you going to start *with with this child? Let us say he is two years old. You would start with the first words he would have said as an infant. There are different approaches we can use in the development of auditory training for the congenitally-impaired child and how much time you spend at each one of these levels will probably depend on how serious the hearing impairment is and when you started the training with this youngster. The first step in auditory training is going to be the development for the awareness of sound. If this child has a severe hearing impairment, he will not have heard most of the sounds in the environment - so you cannot start out and say, "This is a chair; this is your glass of milk". Let us assume that he has not heard anything before. You start out by letting the child know that there is sound in the environment; you do not know that unless you have some kind of auditory signal coming into the ear. We have the hearing aid on the child now and perhaps we will put on a musical record and let him listen to some music just to know that there are sounds in the environment; a door slamming - not teaching him anything - all we are doing now is making him aware that sound exists;; water coming out of a faucet; the door bell ringing; he hears all these things, but you are not doing anything with him yet. You are making him aware that sounds exist. This is step number one in the development of auditory training.*

The second step in auditory training (these are taken from Dr. Carhart at Northwestern, who is responsible for the field of audiology; in fact, he gave the name to the field) is the development of gross discrimination. Here we want this congenitally-impaired child to be able to distinguish differences between one sound or one noise to another. In other words, gross differences: this is a bell, this is a drum, this is an automobile horn. These are gross discriminations so that he will be able to identify the sound when you press the center ring on the automobile steering wheel that it is a horn; when you take the sticks and hit the drum, that it is the noise from a drum; if you push the door bell, that is a door bell. If he hears the horn he can identify it with the automobile, if he hears the sticks on the drum, he can identify where that noise came from, if he hears the door bell he knows that somebody pushed the object outside the front door.

Number three is the development of broad discriminations among simple speech patterns. We usually begin with vowels here; in other words, in our second step we used noises. Now we are going to teach this child to be able to distinguish between various simple speech patterns and we usually begin with vowels. We want the child to be able to distinguish these broad differences between (ah) and (ee) or (a) and (i). Now you are proceeding from the gross to the more specific broad discriminations using actual components of speech rather than environmental noises. Here you are working on trying to make him aware of the differences between such sounds as (ah) and (e). In this third step we are doing this with vowels and we will do it with consonants.

The fourth step in the development of auditory training, the approach is to teach the development of the finer discriminations for speech. Whereas in step 3, we were dealing with broad discriminations, in step 4 we are dealing with finer discriminations. For example, discrimination between (s) and (sh).

These are not broad like (ah) and (i) or (f) and (th). It takes more to be able to make these finer discriminations than these gross discriminations. The sounds for the letters (d) and (t) are not quite as easy as distinguishing between (a) and (i). We are working on the finer discriminations in this part of our auditory training.

What are we doing, in essence? We introduce the person into the world of sound; these are the gross sounds that are available, and you modify them to the finer discriminations which are the raw material for speech, which are the raw material for language. Then you work with this child in developing and building language.

Let us take an example: we are going to work in therapy with a youngster and we have a ball. We show him the ball, we let him hold the ball, we let him say 'ball' - or we attempt to teach him how to say 'ball'. It is so much better to be able to use the actual object at the beginning rather than the picture because he has something concrete to work with. It is not just a flat-surface picture. You sit down with the child, you tune in on his wave length as we have discussed, you say 'ball'; you attempt to teach him how to say 'ball'. You can play catch with him and it becomes something meaningful to him. You can work on 'kitty' or 'cat', and if somebody has a cat, you bring the cat into the classroom. You let the child pet the cat, and then you can build from cat to, "What does the cat say?" "The cat says meow.": hopefully, you pull the cat's tail and he will say "meow" and the child will hear that "meow" through the hearing aid; it may not sound like it does to us if he has a very severe problem but he will hear something. What he hears really depends on the extent of his individual problem. You cannot generalize this and say all children who have this amount of hearing loss have the same problem. It is like climbing a ladder. You use those things in auditory training to build language and you build it out of speech and you use the things that a child is going to use at his age level. Of course, you still have to back up developmentally to pick out those deficiencies that would exist; if you are starting at age 2, there are things he is going to miss that a normal hearing child would have before the age of two. You can work on things like 'mother' and 'father' and any siblings the child might have; you can work on things like milk and dolls - but the important thing to remember is that you are using materials which are meaningful to the child.

In this first aspect of auditory training then, if we are dealing with a congenitally impaired child, then we are working on speech and language; where we begin depends on the severity of the problem and where that child is. You have information from the people who spoke on development in children which gives you a guideline where an average child ought to be and you can make some judgments here.

Not all people are born with hearing impairment. Some people have what is referred to as an adventitious hearing impairment. This is a loss which occurs after language has been acquired as compared to a congenital impairment where the hearing loss occurred before speech and language developed. When *you are dealing with a child or adult who has an adventitious hearing loss you are dealing with somebody who has a command of the language and then incurs a hearing loss. It could be of any degree and we must keep stressing this because you cannot treat a mildly impaired child, necessarily, in the same manner as somebody who has a severe or profound hearing impairment. If this person has a command of the language already, who are you going to work on auditory training with him? In other words, he knows the language and he can use the language.*

The key point is that even though the person is wearing a hearing aid the speech may still not come through clearly, because it is passing through a diseased or damaged hearing mechanism and when it gets to the level of interpretation it does not sound to him like it sounds to you. That is a very good point. In other words, with the people who have adventitious hearing losses and they have command of speech and language, the point is that you want to work with them if they are going to have these discrimination difficulties. You spend time with these people in trying to improve their discrimination abilities. They may confuse different sounds, like (t) and (d), (k) and (g), (s) and (z), and you work on drills with these people to help them in making the differentiation between the various sounds. Now even though the (s) and the (z), for example, do not sound to the person as they sound to you, the pattern itself (however these sounds sound to that individual) may be enough so that he can differentiate between (t) and (d). In other words it is getting into the mechanism, it is getting up to the brain for interpretation, but it does not sound like the (d) as in dog or the (t) as in toy; but the fact is, it does sound differently so that afterwhile, hopefully, he can learn to discriminate the difference between (t) and (d) to the maximum ability of his hearing mechanism.

Not only are we concerned with these as individual sounds, but we are concerned with what is happening when these sounds are placed into words. You have to be able to discriminate words - because the words are the symbols that appear in language. This is what we are doing in auditory training. With some of these youngsters we may still be working on language development in addition to working on these finer discriminations. In other words, there is no clear-cut dichotomy. Your therapy approaches may definitely overlap. The important thing to remember in auditory training is that for the congenitally impaired you are confronted with a different problem than you are with the adventitiously impaired. In one case language is very much involved; in the second case what really is involved is maintaining or improving a deficit in language receptivity due to a poor auditory system. If he has had good speech and language, it could very well deteriorate because we have already spoken about our monitoring system. We hear ourselves as we talk and if a person has a hearing loss and is monitoring himself, he may not be monitoring himself properly and speech can deteriorate. That is why it is good not only to engage in auditory training but also speechreading for preservation of good speech. If a person has a serious hearing impairment, let us say he has a high frequency or high pitched hearing loss, he does not hear the sound for the letter (s) any more. Pretty soon he forgets how that (s) was made. It then becomes slushy and he slurs it; maybe after a time it tends to be omitted because the monitoring system is no longer intact and he is not aware of it. This is what we can do in speechreading and auditory training: we can help preserve good speech which otherwise might deteriorate.

You may ask the question that if you do not improve discrimination ability with these people why engage in it? Because there is a certain adjustment problem which a person goes through. Mose of the people engaged in auditory training are going to be wearing hearing aids. A hearing aid is not the same thing as a new ear by any means. A hearing aid is a mechanical device that amplifies sound. It is a tremendous help, but a hearing aid will never be a duplicate for a perfectly normal ear. In auditory training, you are helping this person adjust to that hearing aid too. They might have discrimination problems or they might have what we call tolerance problems. In other words, loud noises hurt their ears; turn the volume up and with some people this tolerance problem can be so great they will just about "jump out of their shoes". They state that they cannot get used to the aid. You have to take an approach with these people. First of all, the tolerance problem may be a problem that cannot be overcome. In other words, it is a physiological problem so far as the ear is concerned. You might turn the volume up part of the way and it sounds fine; give that little extra boost of volume and this is where the tolerance difficulty starts. Other people become nervous because they are listening to speech and sounds through a mechanical device. You say to them, "It is like a person who has always lived on a quiet residential street for years; then they move onto a heavily-travelled street. Cars, trucks, and busses go by every day. They become nervous; they hear everything that goes by night and day. After about 4 to 6 weeks these people may not even know that the trucks, busses and cars are going by. They have adjusted to it, and hopefully you can adjust to wearing the hearing aid."

The important thing is you have to realize that adjustment is necessary and you are not putting on a new ear. You are putting on a hearing aid. You put these people through certain kinds of drills and exercises of speech and language and sounds. What does this do for the individual? It allows them to adjust to what they can expect.

These people have to be made aware of the advantages and the limitations of amplification of hearing aids. In the older person it may end up in the dresser drawer in a home for the aged. That youngster who goes to school, to satisfy his mother, he puts it on when he leaves for school in the morning, hops on the school bus, and when he gets off the bus, the hearing aid may end up in his pocket. We want persons to be able to get the maximum utilization out of the hearing that is left.

If it is a congenital problem we are working with, the emphasis is on language. If it is someone who has the adventitious hearing loss, then the emphasis here is to help him improve discrimination ability to the best it can be improved, to adjust to the use of a hearing aid; and incorporating this with speechreading. Hopefully, this person is going to be able to get along better in the classroom, with his parents, with his peers. This is what we do in auditory training.

There may be an occasion where speech aides can engage in certain drills as designated by the speech correctionist or the audiologist. Another factor to consider in aural rehabilitation which really is a continuation of what we have been talking about in hearing aids is that of the hearing aid itself; as you know, the hearing aid is not the cure-all; auditory training is not the cure-all; and lipreading is not the cure-all. Hearing aids come in all different sizes and shapes. There are hearing aids which fit all in the ear; hearing aids that fit behind the ear; hearing aids that are built into the temples of eye glasses where the hearing aid is like one that fits behind the ear. You have your conventional or body type instrument which generally can be worn in a pocket by a man, or a woman will wear it on an undergarment. The thing to remember is that hearing aids come in different sizes and shapes; they also come in different powers. If a person has a mild hearing loss and you put on a very powerful hearing aid, he will not be able to turn the volume down to a point where it will not bother him. It is too loud. If you take somebody who has a very severe hearing loss and you put on him a hearing aid which has only mild power, you may turn the volume all the way up and it is not loud enough.

Our last point has to do with counseling people who have hearing impairments. You do not find people coming into a speech and hearing clinic yearning to put on a hearing aid, or even wanting the evaluation. Sometimes a haggard wife brings her husband in because he has been bluffing his hearing loss for several years. An older person finally comes in because the doctor says he should and Medicare is going to pay for it, and since it will not cost anything, he will give it a try. A parent can bring in a youngster for an evaluation under the conditions we talked about earlier, when these problems are detected. The older a child gets in school, the more difficulty you have in putting a hearing aid on him. Junior high school and high school youngsters sometimes rather vehemently resist amplification and you probably know why: what do the peers think about this child who is wearing a hearing aid. It varies from youngster to youngster, and we cannot generalize. There are people who wear hearing aids and people think they are listening to a transistor radio. The transistor radio, as you see people use them now, has done much to alleviate some of the stigma once attached to the wearing of a hearing aid. We experience less trouble in getting youngsters to wear hearing aids at the elementary level, and the preschoolers (once the initial 'trauma' is gone from undergoing the evaluation and having the feeling of a hearing aid on them), then junior high youngsters or youngsters in high school who have to wear hearing aids for the first time.

When we are talking about children, because you will be more concerned with children for this training project, the parent has to accept the child. Really - not just superficially; unless the parent honestly accepts the child, the child is going to know that the parent has reservations. It is also perfectly understandable that the parent is going to be concerned, and at first, most probably, is going to be apprehensive about the whole situation. You have to understand and remember that this is a normal parent; it is very normal for a parent to be concerned and apprehensive and, hopefully, after this stage of the game, the parent will accept the child and accept the problem.

The child has to accept his own problem too and this is not always the easiest thing in the world because the child has to deal with others - which leads *to the third acceptance - the child must be accepted by his peers. This is where you can run into difficulty in the school situation. What is needed here is probably a positive approach. The speech correctionist and physician and other members of the team will have occasion to discuss the problem with the parents to help them. The speech correctionist and others possibly will be counselling the child in accepting the problem. When you talk about acceptance by peers, the problem is not quite as simple as that. But you can take a positive approach and one approach that I have seen work very well, so far as peers accepting children (more so at the elementary and junior high level than at senior high level) is when the child is not in the classroom and the teacher or the speech correctionist explains to the other members of the class about the problem, even explains the hearing aid to the other members of the class so there is no mystery about what is happening. Here is a child who has a hearing problem. You can somehow demonstrate to these children what would happen to them if they had a hearing loss and thus get them to accept the child. Eventually you can lead to the point where the child explains to the members of his class how the hearing aid words and what lipreading class (which the child may be attending once or twice a week) is all about. Be positive in your approach.*

Counceling is a many-faceted area - much more than we can discuss in the brief period. You should be aware that not everybody accepts rehabilitation with enthusiasm. You should also know that we attempt to take positive approaches with these youngsters, with the parents, and with the peers. If you should, in your duties as a speech aide, have the occasion to come into contact with any of these people, you will at least have an appreciation of the problem and have some idea about what is happening.

Identification Audiometry

Robert M. Johnson, Ph. D.

The category that I am to discuss with you this afternoon is termed Identification Audiometry. This term can be used to discuss many types of hearing programs but this afternoon we will limit ourselves to hearing conservation programs in the public school system. As I mentioned to a few of you during your lunch hour this may be one of the areas in which you can function. It would seem to me that an aide could be of great assistance to a speech therapist in conducting a hearing screening program if he was responsible for hearing testing in that system. What I propose to do today is to discuss identification audiometry with you and then on Wednesday go through this procedure with you, show you how the audiometer works and how we use it to screen children in the public schools.

The goal of any hearing conservation program is simply this: to determine those whose hearing deviates from normal as quickly and efficiently as possible, in order to insure medical attention for conservation of hearing, and remedial attention for those who need rehabilitation. In other words, screening tests as we are going to talk about them today have as their purpose the answering of only one question: "Is there a hearing loss?" This is all we are concerned about. At this point we are not concerned about the severity of the loss, but instead we are interested in separating the children into two categories: 1) pass and 2) fail. However, when we do tests of this nature, we must realize that these tests are limited in scope and that we must not draw unwarranted conclusions from them. At a later time we will do additional testing and get more information regarding the type and severity of the loss but until that time we must be careful to make no conclusions that we cannot support.

Perhaps the first question that we should ask ourselves today is, "How many children can we expect to pick up in a public school screening program?" or "How many will fall into our 'fail' category?" In most good screening programs you will generally find that the number of those who fail will be about 5%. This number will vary from program to program but will generally be around 5%. Four to four and one-half percent will have mild hearing problems which will require little or no help or which will require minor medical attention. The remaining .5 to 1% will have hearing losses that will probably need both medical care and remedial attention. Although this is a much smaller group than the first one, it is these children who will have the greatest communication problems. However, if we can detect the hearing loss at an early age the chances of them developing a permanent hearing loss is slight. This, as I said before, is our primary goal. If the child develops a middle ear infection, the sooner it can be detected the less is the chance of a permanent type of hearing impairment.

How, then, do we go about setting up a hearing conservation program in the schools? This is our task for this afternoon and I hope that by the end of the afternoon you will have a pretty good idea of how we conduct such a program.

In any type of a hearing conservation program there are essentially five steps which must be followed. The first step is planning or organizing the program. Before we begin such a program, it is important to sit down with the person who is ultimately responsible for the program and carefully organize it. A little extra time spent in planning a screening program can often save a great deal of time later on. If everything has been organized before the screening begins, the chances are that everything will go smoothly - if not, it will probable turn out to be pure chaos.

In planning the program there are many things one must know. Most important of course is to decide who shall be tested and who shall not. This will vary depending upon how much testing has been done previously in the school, but generally we do not test every grade. If a hearing conservation program is being conducted each year, it is common to test kindergarten and grades 1, 3, and 5, in elementary school and then one grade in junior high and one grade in senior high. In addition to these children it is also advisable to test those in grades 2, 4, and 6 who are referred by the teacher or who were found to have hearing losses the previous year. The reason for testing at both the kindergarten level and in the first grade is that children are much more susceptible to middle ear infections during this age. If they can be detected early and treated medically the chances of developing a permanent hearing loss is much less than if it went untreated. The doctor will treat an infection of this type in several ways. If the infection is detected early, the doctor will generally prescribe an antibiotic for the child; however, if the infection continues for a length of time the doctor will perhaps need to pierce the eardrum and suction out the accumulation of fluid. In some advanced cases he will even put small tubes in the child's ear and allow the fluid to drain over a period of time. The reason a child of this age is more susceptible to a middle ear infection during this time is, according to medical men, twofold. I am sure that Dr. Willeford mentioned a small tube which extends from the middle ear to the nasopharynx called the Eustachian tube. During early age this tube is quite short and extends almost horizontally. As a result, when a child has a cold, it is very easy for mucous to travel up the Eustachian tube and produce an infection in the middle ear. As the child continues to grow, the Eustachian tube not only becomes longer but also assumes a more oblique angle. This is the reason why so many children have middle ear infections early in their lifetime but eventually outgrow this problem.

The next decision one must make in planning a screening program is "How often are we going to test these children?" Generally, in a program of this type we will test each year. Since only alternate grades are being tested after grade 1 it is necessary to test each year to ensure that each child will be tested every other year. If the testing program is not conducted each year then the entire school should be screened rather than alternate grades.

The next question one must consider is, "How many children are we going to test in a certain period of time?" The tester is the one who determines this number. Do not let the school dictate the number of children to be tested in a day. When you meet with the person responsible for the program, tell him approximately how many you can test in a day. This will vary from school to school and also from grade to grade. However, as a rule-of-thumb, one can plan on screening 100 children per day with one audiometer and not be pressed. This will also allow enough time to obtain audiograms on those who have failed the test. We will discuss this later this afternoon. Another determining factor in the number of children who can be tested in one day is the stability of the population. It is a general rule to test all new students who have come into the school since the last screening program so if you are testing a school which has a high yearly turnover you can expect to spend more time than you would in a school with a stable population.

Also, the number of previous tests which have been administered will be an important factor in determining the number to be tested. In virgin territory you will generally pick up 5 or 6% of the total number tested who have hearing problems. However, in a program in which a hearing screening program has been conducted for a number of years and where many children have previously been treated medically the number of hearing losses will be reduced to 2 or 3%. Whenever you double your number with hearing problems and have to administer a pure-tone audiometric test to these children it is quite time consuming. Thus we see a number of factors which will influence the number of children which can be seen in one day and these must all be taken into consideration when one is planning a hearing screening program. This number, of course, will also change depending upon the number of personnel you have to administer the test. If you have, say, three audiometers you should be able to test a school which has a population of 300 or a little bit more without much of a problem.

The next step in planning and organizing a screening program is to determine what your criteria is going to be for a hearing loss. The American Academy of Ophthalmology and Otolaryngology has recommended a criteria that people may follow if they so desire. They state that "if a hearing level of 20 dB or more is found in one ear at 2 frequencies, or both ears at the same frequency, or 30 dB in one ear at one frequency, the person will fail the test". These levels are based on the old ASA standards so we must add approximately 10 dB to these levels today.

Has anyone thus far spoken to you people regarding the differences between the ASA and ISO standards? No? Then, today, let me just say that recently we have changed our norms from an American Standard to an International Standard and for clinical work this amounted to about a 10 dB change. Then on Wednesday I will go into this matter a little more deeply if time permits. The criteria that the AAOO proposed is not adhered to very closely today and we will discuss other levels later on.

The last question of interest to us in planning a screening program is, where are we going to test in the school? The selection of a room is perhaps the most important decision to be made during the planning stage. Try hard to obtain the most quiet room in the school to conduct your program. If you do not have a quiet room you are going to confound your problems considerably. It takes only a small amount of time to run through one group of children if the conditions are quiet but if it is noisy you are going to have multiplied troubles. So before you begin your program, try to obtain from the person responsible for assigning rooms the quietest room possible. Do not end up with a room next to the music room or the gymnasium. This is the room they will put you in many times if you are not careful. If you possibly can do it, go around the school and select a room yourself and ask permission to use the room for the period needed. If there happens to be a room that is carpeted in the school, try for that one. This will reduce the noise level considerably. Also try to pick a room which is away from highway traffic. We tested in one school in the Cherry Creek system in which we have a noise problem due to auto traffic. About the only thing you can do in this case is to obtain a room in the center of the building.

Also, in selecting a room and planning for the forthcoming screening program there are a number of little incidental things that will make things run more smoothly if you make arrangements for them before you begin. If there is a heating system or air conditioner which makes even a small noise you will want this shut off. Sometimes a heating system will seem relatively quiet until you start listening to tones near threshold. Then it sounds like a roaring river. You will also probably need extension cords, a number of chairs set up and tables on which to set your audiometers and recorder. If you can notify the janitor ahead of time he will generally have these items available for you when you are ready to screen.

This completes the planning portion of our discussion. The second step is that of implementing the test. There are two types of tests which are used for this purpose - group tests and individual tests. The advantages of a group test are that you can test a lot more people in a shorter time. One audiometrist can go into a school system and test a large number of people in one day's time. The disadvantage is that you sacrifice accuracy in the group test. The individual test is a far more accurate means of assessing hearing but it is time consuming. However, our reason for testing in the public school is to try to pick up every child in the school who has a hearing loss and if we are going to miss some children by using a group test then I think it would be better to use an individual test and not be so concerned about time. Although group tests are not being used to the extent they previously were, let us examine some of these briefly.

The first group test that was developed in 1949 was called the Fading Numbers Test. This test utilized a phonograph, an audiometer and 40 sets of earphones. The recording consisted of two digit numbers, such as 4-2, 7-3, etc., which are presented through the earphones beginning at a 30 dB level and then reducing the intensity of the tone 3 dB after every pair. Thus, the *level of the figures are reduced from 30 dB to -3 dB presentation level. The task of the student is to mark down on a piece of paper what he hears. If the child was able to hear a 9 dB Hearing Level (ASA) he would pass the test. If not he would be tested using another earphone in case the first earphone were out of calibration. Remember, that 40 sets of earphones are used with this test and it is quite difficult to keep so many earphones in calibration.*

The Fading Numbers test did not prove to be a good test for two reasons. First, it is a speech test and children could have high frequency losses and still pass the test without any difficulty. Secondly, it is a test that can be used only with children who are at least third grade and above. The child had to be able to write down his responses. As a result of these limitations other tests were devised.

A second test that was developed was referred to as the Massachusetts Test. This was developed by Dr. Phillip Johnston and is a pure-tone test which again can be administered to as many as 40 children simultaneously. Three frequencies were tested at three sensation levels 20, 25, and 30 dB. This is a "yes - no" type of test. There were controls used so there were some "no" answers on each paper. The test was graded by counting the "no" responses. If the number of "no" answers deviated by more than two from what it should have been the child did not pass the test. The child was alerted to the fact that a tone was being presented by presenting a light just before the tone. Then the child would mark down on paper if he heard a tone or he did not hear it. Perhaps 5 out of 40 earphones could be cut out of the system at one time so there were times the child would not be getting the tone. This test also had some limitations in that it was again necessary to be able to write and it too was not recommended for children under a third grade level.

The next group test that was developed (and this is a somewhat better test) was called the Pulsed Tone Test. In this test the subject is presented a number of pulses and he is instructed to count the pulses and mark them on a sheet of paper. These pulses are presented at sensation levels of 40, 30, 20, 10, and 5 dB. A loss of 20 dB at any of the test frequencies is considered to be a failure of the test. This test can actually give you more information than the other screening tests. The fact that one can decrease the intensity of a 5 dB level means that the audiometrist can get a fairly good idea of the acuity level of the subject. However, thresholds lower than 5 dB cannot be obtained on this test. If this were being used only as a screening test it would not be necessary to decrease the tone below 15 dB. If they responded correctly at that level, they passed the test.

There have been certain modifications of many of these tests. For instance, in testing young children who cannot write well enough to participate in these tests, they have been modified so that the child can raise his hand whenever he hears a tone. They are instructed that sometimes the tone will not be presented to some earphones so be sure you hear the tone before you raise your hand. This type of test can be given to children as young as kindergarten age.

I am not sure to what extent these tests are being conducted in the schools now, but I would speculate that most of these tests are being used only in a limited capacity. Group tests are utilized in the service and in industry but I believe that most of the hearing tests in the public schools are of the individual type.

This ends our discussion of group tests - let us go on to individual screening tests. Most of the screening that is done in the public schools today is done on an individual basis rather than on a group basis. This is the test we will discuss in detail today and the test that I will demonstrate on Wednesday. Before I begin however, let me say that there are many different types of individual tests and that the procedure I will describe is only one way of screening a group of youngsters rather rapidly without sacrificing accuracy. At least if you do screen in a school you will have a method and can modify it as you go along. Another thing is that if you are screening in the schools that you go to, the speech therapist may also have a certain method of doing this. However, most methods do not vary greatly so I hope by Wednesday evening you will have a fairly good idea of how to screen a little one.

How do we implement a screening program in a public school? Let us assume that we have already met with the person responsible and have made the necessary requirements and are now ready to actually screen the children. When you plan a screening program you should also try to get a couple of volunteer women to help conduct it. Many organizations are very willing to give of their time to help in this type of program. You can use one lady to record for you and a second as a runner. In planning the program, notify the teachers that the child should have a slip of paper with his name and grade on it when he comes to the room to be screened. Also have a large piece of paper for each grade with each child's name on it, and columns entitled "First Screen", "Second Screen" and "Audiogram". These are for recording purposes.

You are now ready to start screening. You have your runner bring in one group of children at a time and instruct them all at once. Keep the instructions simple. What you want them to do is to indicate to you when they have heard the tone. First of all, you ask them to be very quiet so that the children who are taking the test can hear. You will be surprised at the reaction of these little ones - I have had 30 little children sit so still for 10 minutes you could hear a pin drop. This is a big thing for them - they really enjoy this type of experience. Then you instruct them as to what they are going to do. Tell them very simply, "I am going to give you a tone and we want you to lift your hand up real high when you hear the tone and put it right back down." This is all you need tell them - this is all you want them to do. If you are working with small children, say "We are going to practice this," then present a 1000 Hz tone at maximum intensity and have them lift their hands a couple of times to get accustomed to the idea. In this way you condition the child so when they come up individually they are ready to go. With kindergarten or first grade you might run into some difficulty concerning instructions but if you do just remove the earphones and again instruct him as to what you want him to do. After giving the children instructions as to what they *should do, the last thing you need to tell them is that after you have signed their papers they should take them to the recorder.*

Now you are ready to begin testing. When the child sits down you place the earphones on the child. Do not let the child put on his own earphones. You are now ready to present tones to him. This procedure will vary from one person to another, but one which I think works very well is to begin at 1000 Hz in the right ear, at a level of 10 dB above where you are going to screen. If you get a response then drop down to the screening level. We use 15 dB ASA, and 25 dB ISO. If they respond to this signal at 1000 Hz, test 2000, 4000, and 8000 Hz in the right ear. Then, switch over to the left ear and begin there at 8000 and then go down to 4000, 2000, 1000, 500, and 250 Hz in the left ear. Then switch back over to the right ear and pick up 250 and 500 Hz on the right side. This way you have tested both sides without doing a great deal of switching and you are back at 1000 Hz on the right side ready to go for the next child. It is usually a good idea to start at 1000 Hz since that frequency is a little easier to hear and to listen to than a low or high tone. Note that the frequencies I discussed range from 250 to 8000 Hz. You will find many people who will tell you that there is no need to test that many frequencies. There has been a lot of controversy in literature regarding the frequencies which should be included in a screening program but I feel the more frequencies one includes the more information you get. Generally, in cases with otitis media or middle-ear infections you will first detect the impairment in the low frequencies so it is advantageous to test at 250 Hz if possible. However, this is also the frequency which is first affected by noise so if the noise level is too high in the room you are testing in and you cannot get rid of it there is nothing to do but eliminate that frequency. If this situation arises it is better to eliminate 250 and test from 500 to 8000 Hz than to have too many failures at that one frequency. This can cost a tester a real loss of time if conditions are noisy.

There is also a great deal of controversy as to whether or not we should test 8000 cps. Some are in favor of eliminating this frequency altogether while others speculate that 6000 Hz should be substituted for 8000 Hz. And so the battle goes. As yet there are no specific guidelines which specify exactly what frequencies we should check so I personally test from 250 to 8000 Hz, then if I find too many false positives at 250 Hz I will eliminate that frequency. If you do test in the school you will have to use what you think is best - I am only suggesting the use of these frequencies.

So you test the child. He is going to do one of two things - pass or fail the test. If he fails the screening test mark an "F" on his paper and if you have another person screening with you send the child to the other audiometer for a second screening. You will find that many who did not pass the first screening test will pass a second one. This can occur simply from different placement of the earphones on the child and a number of other reasons. If he also fails the second screening test, mark a second "F" on the paper and send him back to his seat. This child then needs to be seen for an audiometric test. When the recorder receives the slip she will mark an "F" in each of the first two columns *and then make a check under the column marked "Audiogram". Later on we will bring this child back for further testing. It is generally better to bring this child back than to test him immediately because you have many young ones waiting and this procedure is time consuming. Furthermore, it is quieter when the children are no longer in the room. If the child passes either the first or second screen then mark a "P" on the paper and send him to the recorder. Once the child has passed the screen we are through with him. So we have three possibilities: 1) the child will pass the first screen (most of them will), 2) the child will not pass the first screen but will pass a second screen, and 3) the child will fail both the first and second screen. When they do this, we send them back to the room and later have our runner take the child from class for a discrete frequency audiometric test. After each child is screened, and those who failed the first two screening tests are given more thorough tests, the implementation process is complete. I hope on Wednesday to have time to show you more completely how this is done.*

This is only one type of an individual screening test. As in every other profession there are always those who are concerned with saving time. People were continually trying to devise a test to shorten the procedure used in screening children. One of the first attempts made in this direction was by a couple of medical men by the name of House and Glorig who developed an audiometer that only tested one frequency of 4000 Hz, and had three intensity levels, 50, 35, and 20 dB. House and Glorig concluded that practically every person who has a hearing loss would be picked up by screening only 4000 Hz. They later changed their minds and decided to add 2000 Hz to the already present 4000 Hz. This audiometer had only two intensity levels, 15 and 35 dB. They would test 4000 Hz at 35 dB, then drop down to 15 dB and if the person responded to both of these signals he would then do the same at 2000 Hz. If the person responded at 15 dB at 2000 Hz then he passed the test.

The advent of these two audiometers set off a minor war in our field. Several investigators promptly began to investigate whether or not this was true and the consensus of these studies was that it was not. They felt that many children would be missed by testing only at 4000 Hz or at 2000 and 4000 Hz. In fact a man by the name of Lightfoot even suggested that maybe the secretaries had made a mistake when typing the manuscript, stating that surely Dr. Glorig would not make such a statement. These studies pretty much negated the use of the Oto-chek for screening in the public schools. However, it has proven more worthwhile in industry. I am sure that Dr. Sweetman spoke to you about noise-induced hearing losses which are generally characterized by a drop in the hearing acuity at 4000 Hz. This is generally the first frequency to be affected and therefore the Oto-Chek can be used to monitor hearing in a noisy situation.

There are also studies which advocate the use of lower intensity levels. A longitudinal study is being conducted in Pennsylvania to more fully investigate identification audiometry and these investigators suggested the use of 10 dB ASA rather than 15 dB ASA. However, they were using acoustically treated *rooms and this makes quite a difference. If we had acoustically treated rooms, I would agree to such levels. However, we must be realistic and if we use too low levels in a non-acoustically treated room we will pick up too many false positives. This would mean wasting a great deal of time and this we cannot afford, therefore we must stay with a little higher level.*

This completes our second step: that of implementing the test. I would like for you to read your notes and try to get the procedure down somewhat before Wednesday and if you have any questions I will answer them at that time. This will make more sense once you have been through the procedure.

The third step in the screening program is the follow-up medical program and this is so important. It does not do much good to screen the children and find a loss if it is not properly treated after it is found. You people probably will not be responsible for this part of the program, especially if you have a school nurse. She is generally responsible for the follow-up. Generally, the one conducting the screening will point out to the school nurse those who should be followed up medically, then the school nurse will contact the parent of the child. The parent will then be responsible for seeing that the child is taken to a doctor. Who is this doctor? We generally like to think he is an otologist or an otolaryngologist but we must not bypass the family doctor. This can lead to many problems, and we do not want to have the general practicioner or pediatrician on our backs. Besides, many of these problems can be treated by these men. The best solution is to refer the child through the family doctor if possible. Many of these men will refer the child directly to an ear specialist; some will try to treat the child and if he does not respond to medication, he will then refer him to a specialist. This eliminates any question of professional procedure.

The most ideal situation is to conduct an otological-audiological program in which there is an otologist present to examine the child, remove any wax present and to make medical recommendations. The Colorado State Department of Public Health conducts this type of a program in the rural areas of Colorado, and these are very successful. However, a strange situation occurs with these programs too. Although the otologist can look at the ear he is not free to prescribe medication or treatment for the child without consent of the parents. Thus, the child still will end up, many times, being treated by the family doctor. The general complaint about non-ENT men treating middle-ear infections is that they have a tendency to undertreat. This, however, may not be true in many cases.

The fourth step is a follow-up educational program. Most of the children we see in a screening program will go to a doctor, be treated and the hearing loss will disappear. A majority of these people will respond to medical treatment and will not experience any difficulty in the classroom. However, there is a small percentage of these children (.5 to 1%) who will have a more severe hearing loss and will need some type of educational program in addition to their regular classroom schedule. The type of program for this child will *often be dictated by the speech therapist and will depend upon the severity of the loss. If the child has a mild loss, the chances are that he may function without too much difficulty in the classroom. If, however, the child has a moderate loss he will probably experience a great deal of difficulty academically. I remember one school we tested last fall in which one teacher had two students with moderate losses. The teacher reported they were having difficulty with their studies and did not seem to be attentive in the classroom. The reason for this inattentiveness was unknown and when I spoke with the teacher both of the children were seated near the back of the classroom away from the teacher. When we detect a child with this type of loss it is necessary to do several things. First, we ask for preferential seating for the child immediately. Secondly, he should be seen immediately by a doctor and if the doctor cannot help him medically then he should be seen in a clinic for a complete evaluation which would include a hearing aid evaluation. Usually, if the child can benefit from amplification, he will go back into the classroom and function quite satisfactorily with an aid. He probably would benefit, however, from auditory training on a limited basis.*

Occasionally we will encounter a child in a screening program who has quite a severe hearing loss and who is not doing well academically. It might be necessary in some instances to have such a child transferred to a deaf school. This, of course, will depend upon the type of special education program which the school has to offer. They might have facilities at the school for such a child in which he could be enrolled part-time in a regular classroom and the remaining time in a special classroom.

We also see another type of hearing loss in the school screening programs which is becoming more prevalent all the time. This is the child who has a small dip in the high frequencies due to intensive noise exposure. There is nothing to be done for such a child, therefore if the dip is not deep we will not recommend treatment but will follow the child each year to see if the loss is progressive.

The final step in the program is reporting the outcome. No type of program is complete until you have written a report to the persons responsible for the program. This report should include the number screened, the number of hearing losses detected and the percentage of those with hearing losses.

The Speech Correctionists' Evaluation of the Use of Supportive Personnel in the Public Schools

The 14 participating public school speech correctionists completed confidential evaluation forms for the purpose of assessing the value of speech aides in this pilot project. The 15 areas which were evaluated are listed below:

I. Percentage of Time Aides Devoted to Various Activities.
II. Specific Activities Performed by Speech Aides.
III. Areas in Which Aides Were Most Helpful.
IV. Areas in Which Aides Were Least Helpful.
V. Acceptance of Speech Aides.
VI. The Continued Use of Speech Aides.
VII. Use of Speech Aides for All Correctionists.
VIII. Minimum Requirements for Speech Aides.
IX. Role of Speech Correctionists in Hiring Speech Aides.
X. Preparation of Aides in the Training Program.
XI. Comments Regarding the Training Program.
XII. The Status of Public School Correctionists and the Utilization of Speech Aides.
XIII. Attitudes Toward Speech Aides.
XIV. Activities in Which Aides Should Not Engage.
XV. General Comments.

The speech correctionists completed the evaluation forms independently of the other participating speech correctionists and the speech aides. The correctionists were instructed to complete the forms in as much detail as possible. It should be emphasized that the participating speech correctionists were selected for the pilot program on the basis of their stated orjectivity regarding the use of supportive personnel; they were willing to evaluate aides relative to the assistance that either could or could not be provided in public school speech correction programs. Each of the 15 areas is discussed separately.

I. Percentage of Time Aides Devoted to Various Activities.

As indicated in Table I, the activities engaged in, in order from greatest time to least time, were articulation, clerical, language, hearing, rate and rhythm, professional and family contacts, and phonation. The average amount of time devoted to phonation was less than 1% and is listed at 0%.

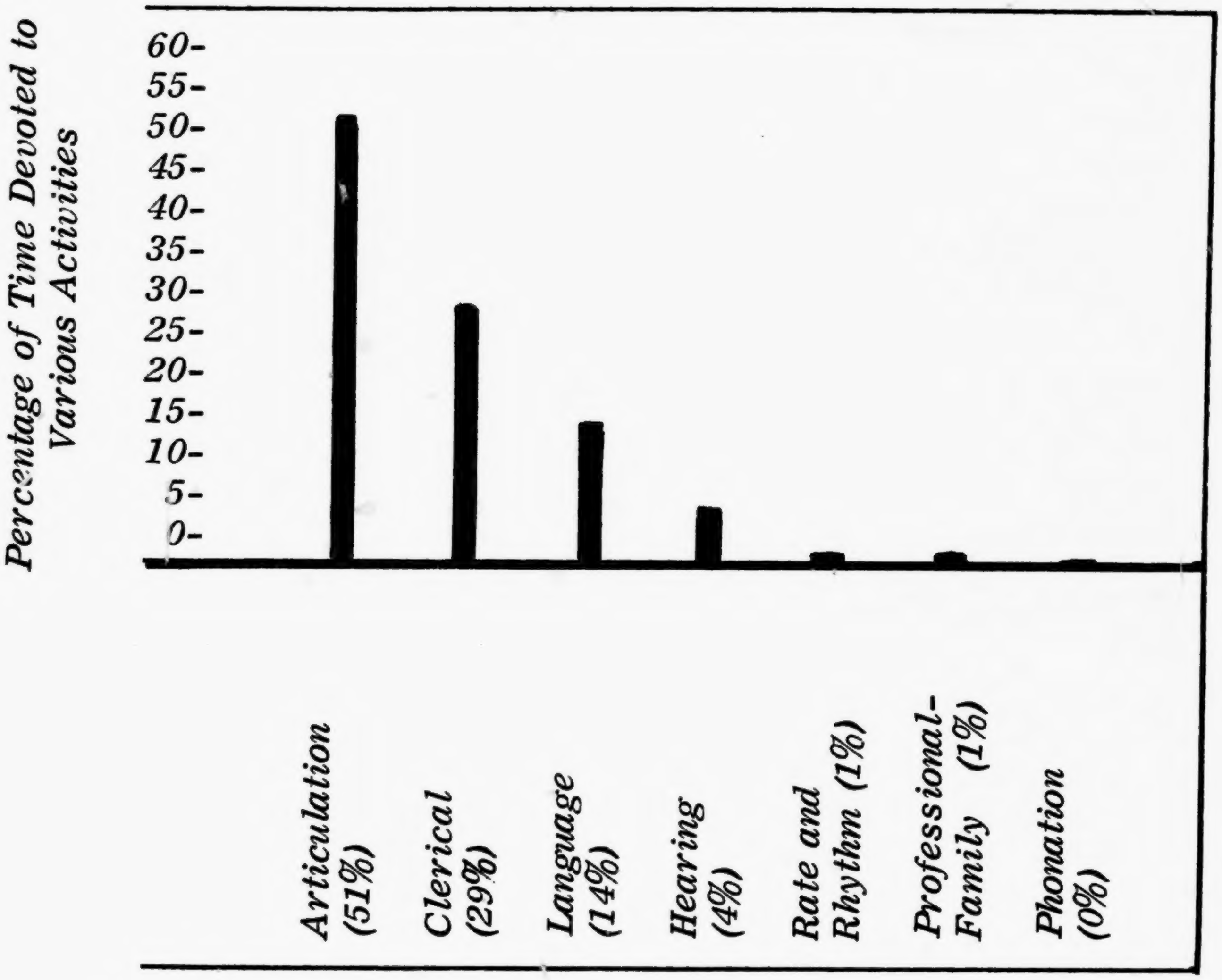


Table I. Time devoted by aides to each category.

It is apparent from the information in Table I that speech aides, in this pilot project, devoted the majority of their time to articulation problems, followed by clerical duties and language disorders. Only a small percentage of time was devoted to hearing, rate and rhythm, and professional-family contacts. Almost no time was devoted to phonation. Based on comments by the speech correctionists, it appears that speech aides could devote more time to hearing, particularly screening. It should be mentioned that each of the nine participating school districts has its own policies relating to hearing screening. Since school nurses and other personnel are responsible for hearing screening in some districts, the low percentage of time spent in this area may be attributed to the fact that screening was not the responsibility of all speech correctionists who participated in this program.

It is not surprising that little time was devoted to rate and rhythm, professional-family contacts, phonation, and diagnostic evaluations, since most of the correctionists agreed, at a meeting prior to the program, that there should be little or no need for aides in these areas. It was expected, however, that clerical duties would have had the highest percentage of the aides' time rather than articulation. The speech correctionists were free to use the speech aides as they desired. There was no prior stipulation by the State Department of Education Planning Committee on what the aides should or should not do since this was a pilot program.

II. Specific Activities Performed by Speech Aides

The various parameters included for evaluation were articulation, clerical, language, hearing, rate and rhythm, professional and family contacts, and phonation. Only one of the 14 clinicians did not utilize an aide for articulation activities. This person was functioning as a hearing clinician and she assigned her aide primarily to language activities.

Articulation

The major areas of articulation in which aides were utilized were ear training, word and sentence drills, and carry-over practice. For ear training, aides drilled the children in the position of a given sound within a word, had them compare correctly and incorrectly produced sounds, and detect specified sounds within continuous speech discourse. Methodology used for word and sentence drills included reading aloud, negative practice, construction of sentences with emphasis on particular sounds, and the use of naturally flowing speech. Carry-over drills consisted of story telling, flannel board activities, role playing, puppets, guessing games, and tape recordings for feedback information. All of the drill materials were prepared either by the speech correctionist or by the speech aide, but those materials prepared by the aide had to be approved by the correctionist.

The aides discussed the progress of their articulation activities with the correctionists. It was not the responsibility of the aides to directly evaluate the children in the remediation process, but rather to provide feedback to the correctionists as well as to serve as good models for articulation production. This did not preclude the aide from rewarding children for correct responses. The reward took the form of either verbal responses from the aides or allowing the children to perform pleasant tasks.

Other articulation activities were engaged in but to a lesser extent. In some instances, the aides observed the children in regular classrooms and reported to the correctionist on the success of carry-over from therapy sessions. The Language Master, available to all but one correctionist, was used by only two aides for articulation exercises. Mirror work and tongue exercises were used infrequently. Two aides were permitted to engage in tongue thrust therapy.

Clerical Duties

Excluding articulation problems, aides spent most of their time in a variety of clerical duties. It initially was anticipated that the aides would devote much of their time in clerical capacities.

The majority of clerical time was devoted to preparing dittoes and stencils, record keeping, and preparing therapy drills both for themselves and for the correctionists. The dittoes and stencils were used for such things as announcements for parents, school colleagues, and for therapy materials to be used with children. In the area of records, the speech aides noted the appropriate information indicated by the correctionist in both the speech and school folders. Therapy drill materials, such as pictures with specific soulds in all positions, word lists, sentences, and stories were prepared. The correctionists who utilized aides for the above activities felt that they were relieved from these time-consuming duties and were subsequently able to spend more time preparing for more difficult cases, working with more difficult cases, or seeing a greater number of children with all types of communication problems more frequently.

The speech aides also helped in preparation of speech books, getting children from the classroom, scheduling, typing, maintaining the speech bulletin board, distributing speech reminders, setting up the speech room, inventorying supplies and materials, and filing. It would appear that, as in the case of articulation, aides can be used quite extensively for clerical duties.

Language

The third activity in which speech aides performed most was language, with the problems most frequently encountered due to minimal brain damage and bilingualism. Primary remediation focused on sequencing, vocabulary building, increasing auditory memory span, correcting grammatical errors, and sentence building. There was considerable use of the Language Master and the Peabody Language Kit in attempting to accomplish the above objectives. In addition, use also was made of puppets, word cards, flannel boards, and stories. The stress on minimally brain injured children was sequencing, auditory memory span, and ear training for consonant and vowel pairs. For bilingual children, the emphasis was on vocabulary, sentence building, and correct grammar.

Hearing

Aides were used infrequently for working with children who had hearing loss. The one correctionist who functioned as a hearing clinician used her aide extensively in speechreading, listening activities, and language concepts. Aides were used by two correctionists for hearing screening and two other correctionists used aides for pure-tone air conduction tests. Those *correctionists who utilized aides for screening and pure-tone tests felt that they were most useful for these tasks and that much time was released for the correctionist, permitting greater attention to serious speech problems.*

Rate and Rhythm

All of the speech correctionists agreed at the beginning of the training program that the aides would not engage in any therapy related to stuttering. They held to this decision and the aides did not work with any stutterers during the pilot program.

Those correctionists utilizing aides for rate and rhythm training had them engage in activities related only to rate and intensity problems. The primary work consisted of singing, sentence imitation, and conversational drills stressing either a slower or faster rate, and either an increased or decreased intensity.

Professional and Family Contacts

As indicated earlier, aides were to have no involvement with parents, parent conferences, or professional persons relative to the children receiving speech therapy. Six of the 14 correctionists, however, did utilize the aides to a small degree. One aide telephoned parents regarding times for parent conferences, two aides had contacts with classroom teachers regarding the children's speech problems, two observed conferences with parents, and one attended a principal-teacher conference regarding the children.

Phonation

Speech aides were utilized very little in this area. Ten of the 14 correctionists did not engage aides in activities related to phonation. In those cases where aides participated with children who had phonation problems, the exercises used were listening, relaxation, and blowing.

III. Areas in Which Aides Were Most Helpful

The speech correctionists were questioned as to the specific areas in which the aides were most helpful. The areas where aides were considered most helpful were articulation drills, language drills, carry-over activities, ear training, preparation of therapy material, and record keeping. The speech correctionists felt that they were afforded more time for greater child contact and preparation for child contact when the aides engaged in the above activities.

IV. Areas in Which Aides Were Least Helpful

There were a variety of areas in which speech correctionists felt that aides should not engage. No general agreement by correctionists, however, was observed. No item mentioned was listed by more than two correctionists. Those items indicated included working with emotionally disturbed children with speech problems, language disorders, tongue thrust difficulties, lisping, articulation placement, aphasia, organic problems, voice disorders, and rate. Other items mentioned were participation in parent conferences, professional-family-teacher contacts, mirror work, record keeping, diagnostics, and teaching of individual sounds. We may attempt to formulate a rationale as to why there was no general agreement. It is quite probable that speech correctionists have developed personal philosophies of operation resulting in individual concepts as to what they need and how they can most effectively utilize their time. The development of personal philosophies is advantageous wherein correctionists exhibit their own ingenuity and methodology, thereby avoiding a "cook book" approach to speech correction.

V. Acceptance of Speech Aides

The speech correctionists were asked about the acceptance of the aide by other speech correctionists in the district, regular classroom teachers in the buildings where aides worked, school administrators, and school nurses. The responses are listed in Table II for all 14 participating speech correctionists. It appears that there was a general, although not unaminous, acceptance of speech aides by all groups indicated. Several correctionists had reservations about aides; they felt, for example, that aides lacked sufficient training, and in some instances were not necessary. They were generally well accepted by both school administrators and regular classroom teachers with relatively few exceptions, particularly after the program was explained to these persons. In several instances, aides had no contact with school nurses but in those instances where there was contact, the aides were accepted.

VI. The Continued Use of Speech Aides

Eleven of the 14 speech correctionists indicated that they would like to have the continued services of a speech aide. Four of the 11 stated that they would like to have an aide on a full-time basis and would have little difficulty keeping one busy. Seven of the 14 correctionists indicated the desire to have an aide on a part-time basis; they felt that one correctionist could not keep an aide busy full time. They also felt that the aide should be shared by one or two other correctionists. One person did not know if she would want an aide again, and two stated that they definitely did not want an aide. The two who did not want an aide indicated that they would prefer additional correctionists. They also stated that the Federal Government has no right to impose a

Speech Correctionist	Other Speech Correctionists	Classroom Teachers	School Administrators	School Nurses
1	Accepted by newer and older persons	Accepted, curious	Accepted, cautious aide not considered correctionist	Accepted
2	Accepted as person, with reservation as aide	Accepted, interested in feasibility	Glad to assess idea, not sold on concept	Accepted as person, curious to why of project.
3	Unfavorable, not enough training	Accepted	Accepted	No contact
4	Accepted	Accepted, few negative teachers who also were not sold on correctionists	Accepted	Accepted
5	Accepted	Accepted, except 1 school where teachers rejected new concepts	Accepted	Accepted
6	Accepted	Accepted	Accepted	Accepted
7	Accepted last 2 or 3 weeks	Accepted	Accepted	Accepted
8	Accepted as person, cool toward title	Accepted	Accepted by principals, Administration mixed feelings	Accepted
9	Aide not necessary	Accepted, teachers had aides	Accepted	Accepted
10	Did not know	Accepted	Accepted	No contact
11	Accepted with reservations	Did not know	No, money could be better spent	No contact
12	Accepted as person, considered her experiment	Accepted as person, did not know professionally	Accepted	No contact
13	Curious	Apprehensive	Accomodating	No contact
14	Accepted	Accepted	Accepted	Accepted

Table II. *Acceptance of Aides by other disciplines.*

a speech aide program on the public schools. The one who did not know whether or not she wanted an aide said that more time was needed to evaluate the concept.

VII. Use of Speech Aides for All Correctionists

This question asked the speech correctionists to generalize in terms of all correctionists having aides either on a part-time or full-time basis. Eleven of the 14 speech correctionists stated that speech aides should not be mandatory for all public school correctionists. The major reason for this position was that correctionists should have the opportunity individually to make this decision based on their own needs and philosophies. Other reasons given for this position were that some correctionists are not emotionally ready for aides, some desire to work alone, and some do not know how to utilize an aide. Of the three correctionists who felt that all should have speech aides, one felt that it was beneficial in working with the hearing impaired, one thought that each school district should have at least one aide, and one felt that each aide should work for two or three correctionists. It can be stated generally that these speech correctionists felt that each person should make his own determination in the matter without external pressure.

VIII. Minimum Requirements for Speech Aides

The majority of speech correctionists felt that all speech aides should have a high school education, be at least 18 years of age, and have a sincere desire to work with children. In addition, they felt that the aides should meet all requirements of the individual school district exclusive of the academic college degree. It also was recommended that speech aides have their own automobiles.

Other comments included that speech aides should have some experience in clerical duties such as typing, be of above-average intelligence, and have a willingness to cooperate with school personnel. One correctionist stated that each school district should determine its own requirements, another indicated that two years of college training should be required, one stated that the aide should have two semesters of survey courses in speech pathology and related areas, and one stated that an aide should be a person at the junior or senior college level in speech pathology.

On the basis of this pilot program, most correctionists agree that the minimum requirements should be:

1. *High School Diploma*
2. *Minimum age of 18*
3. *Sincere interest in children*

4. Own an automobile
5. Meet school district's requirements exclusive of college degree

IX. Role of Speech Correctionists in Hiring Speech Aides

Ten of the 14 speech correctionists felt that they should be involved in the interviewing of aides prior to actual employment. The major reason given was the importance of compatibility between correctionists and aides; by being involved, there would be less chance of personality conflict and a greater opportunity for rapport. No other reasons were cited. Of the four who stated they should not be involved in interviewing, two indicated that the interviewer responsible for hiring should have some awareness of the field. They also stated that certain guidelines should be established for hiring personnel. A third correctionist said the procedure should be no different than that used for placing student teachers, and a fourth person did not qualify the answer.

X. Preparation of Aides in the Training Program

Seven of the 14 correctionists were satisfied with the three-week training program. Five of these seven stated that they would have liked more time devoted to articulation problems, actual work practice, a greater familiarity with equipment (tape recorders and the Language Master), ear training, and learning the phonetic alphabet. Two of the seven made no comments. Of the seven who were not satisfied with the preparation of the aides, it was strongly recommended that the aides receive more in-depth training in use of equipment, ear training, sound production and stimulation, observations and actual work practice, articulation, the phonetic alphabet, and the conducting of drills. These recommendations are consistent with the utilization of aides in spending the majority of their time with articulation problems. With the exception of the phonetic alphabet, all of the above areas were included in the training program but apparently with not enough concentration.

XI. Comments Regarding the Training Program

The length of the training program (three weeks) should have been longer according to seven of the 14 speech correctionists. Two of these seven stated that an aide should have a college degree before working; they commented that after spending five years earning a degree themselves, it did not seem reasonable that an aide could work with children after only three weeks of training. The other five indicated that the training program should be a least one week longer in order to provide more intensive training in ear training, actual work practice, articulation, equipment usage, the phonetic alphabet, and speech and hearing terminology. They did stipulate, however, that if the training program *were modified, the training could be accomplished in three weeks. This could be done by spending less time on some of the areas which were covered that were not of use to the aides in their work.*

The remaining seven speech correctionists stated that the length of the training program was adequate or that it could be even less than three weeks. Those who felt that the program could be of shorter duration indicated that certain areas could be eliminated or less time devoted to them. These areas included hearing, anatomy and physiology of the speech and hearing mechanism, and organization and administration of public school programs. Some felt that three weeks would be adequate if more stress were placed on articulation, equipment, and actual work experience. Although there is no agreement on what the actual length of training period should be, there appears to be considerable agreement among all 14 correctionists as to what should be stressed.

XII. The Status of Public School Correctionists and the Utilization of Speech Aides

During the initial meeting of speech correctionists, discussion focused on the present status of speech correctionists in the public schools. There were varied feelings as to how the other professionals in the field viewed the public school correctionist. Some felt that they were second-class citizens not fully accepted by those persons working in such settings as universities or hospitals. Several correctionists indicated that a possible reason for this image was due to excessive case loads in which many minor speech problems were seen and not enough time was available to engage in evaluation and therapy with more serious cases.

A different concept for the public school correctionist was discussed. The approach would be a public school "speech pathologist" more heavily involved in the evaluative process of communication disorders and working primarily with problem cases. In addition, the public school speech pathologist would have speech aides, under her supervision, working with less serious problems, engaging in clerical activities, preparing therapy materials, etc.

It was realized by the correctionists that numerous questions would have to be answered regarding this approach. School districts would have to be willing to reduce the size of case loads, guidelines for what constitutes serious communication problems would have to be established, appropriate supervision would have to be conducted of aides, and other issues would need to be taken into consideration. It was agreed that much discussion would be necessary if the matter were to be pursued.

There were various opinions expressed by the correctionists regarding the concept. One speech correctionist indicated that the situation already existed in the pilot program, since more of her time was released because of *the aide, she had greater time for evaluation and therapy with more serious cases. In addition, she was responsible for the supervision of her aide. Nine other correctionists thought the idea had merit. Most of those who were favorable felt that speech aides should then be required to have more specialized training. Some felt that the aide training period should then be two years in duration. Several of the nine also indicated that they were frustrated under the present situation since case loads were excessive, and there was insufficient time for proper evaluation and intensive therapy. One correctionist indicated that the problem was a serious one and that the profession should investigate it.*

Four correctionists felt that the concept was unacceptable. The reason cited by all four was that aides simply did not have sufficient training to embark upon this kind of program. They felt that it would not be wise to allow aides to engage extensively in work with children, even children who have speech problems considered to be of a "minor" nature.

Regardless of the feelings expressed in this matter, it did appear that several of the speech correctionists felt frustrated because of certain pressures made on them. The major pressure seemed to have to do with the time factor. These correctionists wanted more time to spend with fewer children; they wanted more time for evaluation and for intensive therapy.

XIII. Attitudes Toward Speech Aides

There were numerous negative reactions toward speech aides throughout the state and the correctionists participating in this program were asked to give their opinions as to why these attitudes existed. The major reason given was that many correctionists felt their jobs would be threatened. They were concerned that school districts would regard aides on an equivalent basis with them in terms of qualifications; the result would be school districts hiring aides instead of correctionists. This undoubtedly was an important concern when the shortage of trained speech correctionists is considered. In addition, since aides did not have the same degree of academic training, there was speculation that some school districts would hire aides because their salaries would be considerably less.

Four of the speech correctionists stated that some correctionists were concerned that an aide, with only limited training as compared to their training (which was usually a four or five year program), could work with children. A feeling held by many correctionists was that the entire public school speech correction program would be downgraded by the use of speech aides. Another comment indicated that speech aides would result in more work for the correctionists because of the necessity of supervision and the time needed to work out lesson plans and other activities. Some opinions presented indicated that money for speech aides was not a wise expenditure of federal funds. It *was stated that the funds could be better spent for additional correctionists and equipment. One correctionist felt that negative attitudes existed because of the ignorance of some speech correctionists in understand the concept of speech aides. One correctionist had no comment regarding this question.*

Most of the speech correctionists felt that their colleagues were more amenable to the pilot program after being informed of its specific nature and goals. This was not an unqualified acceptance of speech aides but a willingness to find out how the participating correctionists felt after the pilot program. It should be mentioned that information on the pilot program was provided at two different meetings in the state, a State Department of Education Workshop and the state meeting of the Colorado Speech and Hearing Association. At both of these meetings, all correctionists were given the opportunity to ask any questions they had about the program.

XIV. Activities in Which Aides Should Not Engage

There was general agreement regarding certain areas in which speech aides should not be involved. These included stuttering, disorders of an emotional nature, and perceptual difficulties. In addition, the majority of correctionists stated that aides should not be involved in evaluation, speech screening (excluding hearing screening), initial presentation of sounds, and parental and professional contacts. A few speech correctionists indicated that aides should not engage in speechreading, work with mentally retarded children, and voice cases. One speech correctionist stated that if the aide can perform the task then she should be able to do it. The majority of correctionists, however, were quite specific in what they felt aides should not do.

XV. General Comments

The final section allowed the speech correctionists to make any comments they wished regarding the use of supportive personnel in a public school speech correction program. Many of the comments reiterated the responses to earlier questions. Several items, reported by a majority of the correctionists are presented since they seem to emphasize strong feelings. Some felt that better use could be made of Federal funds, some indicated that the aides should not be expected to do the job of the correctionists but should be aides as defined by guidelines, and several stated that a lack of space limited their effective use of aides. A number of the correctionists felt that their program was more effective since they had more time to engage in individual therapy with serious problems and also to devote more time to evaluation. In some cases, the assistance provided by the aides allowed the correctionist to see some children twice a week instead of only once. One correctionist emphasized that she was busier with the aide because of the amount of preparation time. Several indicated that they had more time to participate in staff conferences and counseling with teachers and other school personnel. The majority of correctionists stated that the speech aide program was a rewarding as well as a learning experience for them.

The Speech Aides' Evaluation of the Use of Supportive Personnel in the Public Schools

The ten speech aides in the pilot program were asked to respond to ten areas of evaluation. As was the case for the speech correctionists, the forms completed by the aides were treated in a confidential manner. The ten areas of evaluation included the following:

- I. *Activities in Which Aides Were Most Helpful.*
- II. *Activities in Which Aides Were Least Helpful.*
- III. *Acceptance of Speech Aides.*
- IV. *Desire to Continue Work as an Aide.*
- V. *Minimum Requirements for Speech Aides.*
- VI. *Role of Speech Correctionists in Hiring Speech Aides.*
- VII. *Satisfaction with Preparation in the Training Program.*
- VIII. *What Should Be Stressed in a Training Program.*
- IX. *Use of Aides to Maximum Possible Extent.*
- X. *Reaction to Field of Speech Pathology and Audiology.*

The speech aides completed the forms without consultation with each other or with speech correctionists. The aides were asked to be as specific as possible in answer the questions. The questionnaires were answered after the Pilot Program was completed.

I. *Activities in Which Aides Were Most Helpful.*

The majority of aides felt that they were helpful from two aspects. The first was engaging in clerical duties. The second was releasing the correctionist to devote more time to working with individual children who had more serious speech problems. In addition, the released time allowed the correctionist to have more time for parent contact and conferences. Most of the aides did not elaborate on specific disorder areas but answered in a more general way. Several aides indicated that they were most helpful with articulation problems but no other disorders were mentioned. A few aides specifically stated that they were helpful in carryover activities, listening drills, tongue exercises, and preparation of therapy materials for the correctionists. Although the aides were not too specific, all ten felt they had been helpful to the speech correctionist.

II. *Activities in Which Aides Were Least Helpful*

Two of the speech aides indicated that they did not know the areas in which they were least helpful. One aide stated she was helpful in whatever she was assigned to do by the correctionist. Of the remaining seven aides, there was no unaminous agreement in the answer to this question. Almost every response was different. The areas listed included stuttering, cleft palate, ear training, parental contact, voice problems, rate problems, initial sound production, sound placement, reports, and tongue thrust difficulties.

The fact that the aides were not consistent in their responses may be because the correctionists, for the most part, adhered to the original guidelines established regarding what aides should not do. Since most of the aides, therefore, did not engage in these activities, they may not have had an opportunity to do "less helpful things." It should be mentioned also that there was no general agreement in the answer to this question by the speech correctionists. We might conclude that the speech correctionists utilized the aides according to their own philosophies or needs. The possibility cannot be overlooked, however, that the speech aide concept is too new at this time to be able to arrive at more specific answers.

III. Acceptance of Speech Aides

All ten speech aides felt that they were accepted by the speech correctionists for whom they worked. Although two of the correctionists indicated that they were not in favor of aides, they maintained their objectivity in the program by not overtly indicating their disapproval of the concept to their aides. The aides generally felt that the correctionists were quite patient with them and were willing to devote the necessary time to orient them to their jobs. Most of the aides indicated that they were given more responsibility as the program progressed.

Seven of the ten speech aides stated that they were accepted by the other speech correctionists in the school district. One aide indicated that she felt she was accepted by the speech correctionists as a person but not as an aide. The remaining two aides felt that they were not accepted and that the other correctionists in the districts reacted "coldly."

According to the speech aides, all were accepted by the regular classroom teachers. One aide indicated that there was one school in the district that did not approve of aides but she stated that the teachers in this school also did not approve of speech correctionists. One aide made a point to mention that she felt her acceptance was due to the fact that the speech correctionist was well regarded by all of the classroom teachers in the school district.

All of the speech aides felt that they were accepted by school principals and administrators. The majority of aides indicated that they were accepted by school nurses although most of them had very little contact with the nurses. There were no other comments made relative to acceptance by either school administrators or school nurses. These are subjective impressions but do not differ greatly from the impressions given by the participating speech correctionists although there are some exceptions as can be seen in Table II.

IV. Desire to Continue Work as an Aide

Seven aides responded yes without reservation. Their general comments indicated that this was a rewarding experience for them. They enjoyed working with children and felt that it was personally satisfying to assist in improving children's communication problems. Two of the ten speech aides said that they would like to pursue a career in speech pathology and were hopeful of being able to do so. One aide stated that she would like to continue working as an aide but under different conditions. She did not elaborate but this aide indicated that only half of her time was utilized.

V. Minimum Requirements for Speech Aides

The responses to this question were general. Age was not indicated by any of the ten speech aides; three stated that the aide should have at least a high school education. One said that it would be desirable to have one year of college training with emphasis in the remediation area. All of the speech aides stated that persons should have a desire to work with children. The majority recommended experience with children and gave such examples as Scouts and Sunday School. One speech aide made no comment. With respect to age, the range for the speech aides in this pilot project was from 18 to 57 years. From the aides point of view, it appears that the most important factors are a desire to help children and some kind of previous experience in working with them.

VI. Role of Speech Correctionists in Hiring Speech Aides

Seven speech aides stated that the correctionists definitely should be involved in the interview prior to actual employment. Their reasons were quite similar to those given by the speech correctionists, mainly the need for compatibility between aides and correctionists so that there would be a minimum possibility for personality conflict. The aides also felt that correctionists had a right to decide who should work for them. One aide had no comment on this question, one did not know, and one stated that the correctionist should be involved only to the extent that a decision is being made as to whether or not an aide was wanted.

VII. Satisfaction with Preparation in the Training Program

Six of the speech aides responded that they were satisfied with the preparation received in the training program, but recommended more emphasis in certain areas. They felt that there should have been more stress on child development, sound drills, placement, sound production, and articulation. It was emphasized by the aides that more instruction in these areas *would have been more in agreement with the activities in which they actually engaged in on the job. They stated that there could have been less stress on administration in the schools, diagnostics, and hearing.*

Of the four aides who were not satisfied with their preparation, it was the feeling that more time should have been devoted to observing speech correctionists prior to the training program and more work experience replacing some of the formal instruction during the three weeks. They indicated that this would have enabled them to be more productive at the beginning of their work with the correctionists and would have saved the correctionists time by eliminating the need for additional explanations. Eight of the ten aides stated that the three week training program was sufficient but that the indicated factors should be considered in modifying the program. Two of the aides said that the training program should be extended an additional week with the emphasis during the first week on observation of speech correctionists in action.

VIII. What Should Be Stressed in a Training Program

One speech aide made no comment. There was general agreement by the other aides that articulation should be emphasized. Other recommendations were learning the phonetic alphabet, observations of speech correctionists, work experience, equipment instruction (including the use of ditto and related office machines), and instruction in printing letters compatible with the way they are taught in elementary school. In addition, one person stated that the code of ethics relative to the profession should be outlined clearly and another aide said that more attention should be focused on the etiologies of disorders as well as the possibilities for actual correction. The emphasis on articulation is consistent with the area in which they worked the most. The desire for office machine instruction reflects the time devoted to clerical activities.

IX. Use of Aides to Maximum Possible Extent

Six of the speech aides stated that they were used to the maximum and that there was no time in which they were not utilized. They felt that they were useful to the correctionist and this is why they were kept busy. One aide stated that she was not fully utilized but attributed this to the lack of sufficient space in the schools in which to work. Since she had to share the same room with the correctionist on numerous occasions, it was not possible to be of greater assistance. This aide also pointed out that supportive personnel could not be of the greatest assistance since the state law requires that the correctionist be in the same building as the aide. The result, according to her, was that this lack of freedom negated a much greater use of aides. One speech aide felt that, for the most part, she was used only to a degree. She stated that if the correctionist had prepared lesson plans for herself, then it *would have been easier for the correctionist to know what to assign to the aide. One speech aide indicated no, but did not elaborate. There would seem to be inconsistency on the part of some aides since one would expect, that if all the aides felt they had been accepted by the correctionists, they would have been fully utilized and would not have negative reactions regarding the time factor.*

X. *Reaction to Field of Speech Pathology and Audiology*

All of the speech aides were quite impressed, according to their comments, with the field. Some of their comments indicated that it was a rewarding field, it was impressive, interesting, and worthwhile. One aide indicated that it was overwhelming and that there were many phases of it but that they all overlapped. It is apparent that the answers were subjective but the nature of the question lends itself to this type of answer. The important consideration was the favorable reaction to speech pathology and audiology and the fact that two of the younger aides wanted to pursue it for a career. In a sense, the program may even be considered a recruiting device.

Summary and Conclusions

On the basis of the speech correctionists who participated in this pilot program, speech aides can be effectively utilized in the public schools. The speech correctionists, however, should have the privilege of deciding whether or or not they want or need a speech aide. Not all speech correctionists need, nor can utilize speech aides. The areas in which aides can be most helpful, according to this pilot program, are in articulation and clerical activities. The minimum requirements for speech aides should be a high school education, a desire to work with children, some prior experience with children, and an automobile. Each school district should be responsible for hiring its own aides. Speech correctionists should have the major responsibility of deciding in which activities speech aides should engage.

In this program, it was decided that they should not be involved in disorders related to stuttering and phonation. There was no clear decision regarding language disorders related to organic etiologies. In addition, the aides should not be involved in parental and professional contacts. The speech correctionists should be involved in the interviewing of prospective speech aides. The training program should give greater emphasis to the activities in which they will be engaged. The speech correctionists favorably viewed the concept of being able to spend more time with problem cases, engaging in more diagnostic work, having reduced case loads, and having speech aides working under their supervision with problems of a lesser magnitude. It was also felt that there would be less negative reaction to the use of supportive personnel if the concept were clearly defined and explained to all concerned. The need for guidelines was emphasized so that the status of the profession was rightfully understood and preserved.

The speech aides felt that they were most helpful in clerical activities and in releasing the speech correctionists' time to other more pertinent activities. They felt that they were well accepted by most other school personnel. The majority of speech aides want to continue working as aides. Speech aides feel that the prior experience working with children is the most important requirement for the job. They believe that the correctionists should be involved in the interviewing process prior to employment. It was indicated that the training program should provide more observation and work experience opportunities and less emphasis on areas in which they will not be involved. Most aides stated that they were fully utilized by the speech correctionists. In this program, 878 different children were seen by the ten aides. All of the speech aides were subjectively impressed with the profession.

There are presently no national guidelines regarding the use of supportive personnel for speech correctionists in the public schools. It appears, based on the literature, that supportive personnel will continue to be utilized on an increasing basis. It is mandatory, therefore, that guidelines be established by the professionals so that a policy, consistent with the American Speech and Hearing Association, be formulated as soon as possible.

ORGINAL TRAINING AGENDA

Location: STUKEY SCHOOL, 11080 Grant Drive, Northglenn

Monday, February 12, 1968

9:00- 9:50	Introduction and Orientation	Mr. Wiggins Dr. Alpiner
10:00-10:50	Public School Organization and Administration	Miss Field
11:00-11:50	Role of the Speech Specialist in the Public Schools	Miss Field
1:00- 1:50	Professional Responsibilities and Code of Ethics: American Speech and Hearing Association, Colorado Speech and Hearing Association, Colorado State Department of Education	Dr. Boone
2:00- 2:50	General Discussion on Day's Proceedings	Mr. Wiggins Dr. Alpiner Miss Field Dr. Boone

Tuesday, February 13, 1968

9:00-11:50	Child Growth, Speech, and Language Development	Dr. Yoder Mr. Augustine
1:00- 1:50	The Speech Mechanism	Dr. Yoder Mr. Augustine
2:00- 2:50	Discussion on Day's Proceedings	Dr. Yoder Mr. Augustine

Wednesday, February 14, 1968

9:00-11:50	Disorders of Speech and Language	Dr. Weiss
1:00- 2:30	Evaluation of Speech and Language Disorders by the Speech Specialist	Mrs. Merten
2:30- 2:50	Question and Answer Session	Mrs. Merten

Thursday, February 15, 1968

9:00-11:50	*Rehabilitative Procedures for Speech and Language Disorders*	*Mrs. Hull*
1:00- 2:50	*General Discussion on Day's Proceedings*	*Mrs. Hull*

Friday, February 16, 1968

9:00-10:50	*The Hearing Mechanism*	*Dr. Willeford*
11:00-11:50	*Hearing Disorders*	*Dr. Sweetman*
1:00- 1:50	*Hearing Evaluation*	*Dr. Sweetman*
2:00- 2:50	*Question and Answer Session*	*Dr. Willeford* *Dr. Sweetman*

Monday, February 19, 1968

9:00-10:50	*Hearing Rehabilitation*	*Dr. Alpiner*
11:00-11:50	*Question and Answer Session*	*Dr. Alpiner*
1:00- 2:50	*Identification Audiometry*	*Dr. Johnson*

Tuesday, February 20, 1968

9:00-11:50	*Observation of Speech Specialist*	*Assigned School in Respective Districts*
1:00- 2:50	*Discussion of Observations (Return to Stukey School)*	*Dr. Lundeen*

Wednesday, February 21, 1968

9:00- 2:50	*Meeting with Speech Specialists from the Ten Districts*	*Dr. Alpiner*

During this period, speech aides will observe speech specialists at various schools which will be assigned for the day.

Thursday, February 22, 1968

9:00- 2:50	*Duties and Responsibilitied of the Speech Aide*	*Mrs. VanTine*

Friday, February 23, 1968

9:00- 2:50	*Duties and Responsibilities of the Speech Aide.* *Equipment Demonstration*	*Mr. Brooks*

Monday, February 26, 1968

9:00- 2:50	*Observation and Discussion with Assigned Speech Specialist in Each District*	*Assigned Speech Specialist*

Tuesday, February 27, 1968

9:00- 2:50	*Practicum under Assigned Speech Specialist in Each District*	*Assigned Speech Specialist*

Wednesday, February 28, 1968

9:00- 2:50	*Practicum under Assigned Speech Specialist in Each District*	*Assigned Speech Specialist*

Thursday, February 29, 1968

9:00- 2:50	*General Discussion on Practicum*	*Dr. Bowler* *Dr. Cary* *Dr. Alpiner*

Friday, March 1, 1968

9:00-10:50	*Panel Discussion on Duties and Responsibilities*	*Speech Specialists from Each District*
11:00-11:50	*Panel Discussion on Training Program*	*Dr. Alpiner* *Dr. Yoder* *Dr. Bowler*
1:00- 1:50	*Question and Answer Session*	*Dr. Alpiner* *Dr. Yoder* *Dr. Bowler*
2:00- 2:50	*Final Instructions and Summary*	*Mr. Wiggins* *Dr. Alpiner*

PROPOSED REVISION OF TRAINING AGENDA

First Week

Day	*Time*	*Topic*
First	*9:00- 9:50*	*Introduction* *Purpose* *Orientation*
	10:00-10:50	*Public School Organization*
	11:00-11:50	*The Role of Speech Correction in the Public Schools; Relationship to the American Speech and Hearing Association (including the Code of Ethics)*
	1:00- 3:00	*Child Growth, Speech, and Language Development*
	3:00- 3:30	*Questions*
Second	*9:00-11:50*	** Observation of Speech Correctionists*
	1:00- 3:00	*Discussion of Observations*
Third	*9:00- 3:00*	** Observation of Speech Correctionists*
Fourth	*9:00- 3:00*	** Observation of Speech Correctionists*
Fifth	*9:00-11:50*	*Discussion of Observations (Articulation, Clerical, Language Emphasis)*
	1:00- 1:50	*The Normal Speech Mechanism*
	2:00- 3:00	*The Normal Hearing Mechanism*
	3:00- 3:30	*Questions*

** Speech Aide should observe correctionist(s) she will be working with.*

Second Week

Day	*Time*	*Topic*
First	*9:00-11:50*	*Disorders of Speech and Language*
	1:00- 3:00	*Disorders of Hearing*
	3:00- 3:30	*Questions*
Second	*9:00- 3:00*	*Observation of Speech Correctionist*
Third	*9:00-11:50*	*Remediation Overview of Speech Disorders*
Fourth	*9:00-11:50*	*Equipment Utilized in Speech Correction*
	1:00- 3:00	*Hearing Screening, Pure Tone Testing (Equipment and Procedures)*
	3:00- 3:30	*Questions*
Fifth	*9:00-11:50*	*Clerical Responsibilities*
	1:00- 2:00	*Use of Clerical Equipment (Duplication Procedures etc.)*
	2:00- 3:00	*Discussion and Questions Regarding Clerical Activities)*

Third Week

First	*9:00- 3:00*	*Practicum Under Supervision of Speech Correctionist*
Second	*9:00- 3:00*	*Practicum Under Supervision of Speech Correctionist*
Third	*9:00-11:50*	*Discussion of Remediation Practicum Experiences*
	1:00- 3:00	*Discussion of Clerical Practicum Experiences*
	3:00- 3:30	*Questions*

Day	*Time*	*Topic*
Fourth	*9:00-11:50*	*Guideline Meeting with Speech Correctionists*
		(Aides Observe in the Public Schools During This Time)
	1:00- 3:00	*Guideline Meeting With Speech Aides*
	3:00- 3:30	*Questions*
Fifth	*9:00- 9:50*	*Concluding Discussion on Articulation Procedures*
	10:00-10:50	*Concluding Discussion on Language Procedures*
	11:00-11:50	*Concluding Discussion on Clerical Procedures*
	1:00- 3:00	*Concluding Discussion on Equipment Procedures*
	3:00- 3:30	*Final Instructions*